Cumulative Subject Index¹

Volumes 103-108

Α

Acetaldehyde

electrocatalytic oxidation on Au electrodes, 104, 37 Acetic acid

electrocatalytic oxidation on Au electrodes, **104**, 37 vapor-phase aldol condensation with formaldehyde over V₂O₅-P₂O₅ catalysts, **107**, 201

Acetone

effect on isopentene synthesis over sulfonic acid resin catalyst, thermodynamic and kinetic analyses, 103, 177

and formaldehyde, vapor-phase aldol condensation, production of methyl vinyl ketone, **106**, 273

Acetylene

reactions over fluorinated Al₂O₃ catalysts, 105, 71 Acetylene dicarbonic acid

adsorption on γ -Al₂O₃, reactivity with spillover hydrogen, **104**, 307

Acid-base sites

on Al₂O₃, measurement with N₂ adsorption method, 105, 536

Acidity

determination for

fluorinated mordenites, 103, 399

H-Na-ZSM-8 zeolites, effects of H⁺ exchange, pretreatment conditions, and poisoning of stronger acid sites, **105**, 416

surface, role in cyclohexane dehydrogenation and isomerization over TiO₂–ZrO₂–V₂O₅ ternary oxides, **107**, 195

Acid sites

Brønsted and Lewis, generation on silica surface by addition of dopant cations, 105, 285

on H-Na-ZSM-8 zeolites, poisoning, effect on acidity and catalytic properties, 105, 416

Acrolein

formation from propylene oxidation over Fe-Sb-Ti-O catalysts, **107**, 307

oxidation over 12-molybdophosphate catalysts catalytic testing, 106, 16

characterization, 106, 1

reaction mechanism, 106, 23

Acrylic acid

adsorption on γ-Al₂O₃, reactivity with spillover hydrogen, 104, 307

Acrylonitrile

dimerization over polymer-bound catalysts, 107, 407

Additives

effect on surface area of Al₂O₃-, MgO-, and ZrO₂based oxide supports for catalytic combustion, 103, 385

solid, effects on oxidation and reduction of terbium oxides, 103, 216

Adsorption

alcohols on H-ZSM-5, IR spectroscopy, 105, 455 benzene, CO, ethylene, and 1-hexene on Pt/Al₂O₃ and Pt-Sn/Al₂O₃ catalysts, 103, 249

on catalyst surfaces, in situ analysis using NMR probe, 106, 111

CC

on Cu catalysts, 108, 250

and H₂ on K-promoted Rh/SiO₂ catalysts, **105**, 432 CO₂ on Mo/Al₂O₃ catalysts, determination of MoS₂ surface coverage, **106**, 65

-desorption of CO and CO₂ on chromia-promoted magnetite, isotopic exchange measurements, implications for water-gas shift, 103, 65

ethylene oxide

on Ag(111) catalysts, effects of Cl and Cs promotors, 106, 54

on MgO, IR spectroscopy, 104, 299

gas-oil sulfur compounds on Mo- and Ni-containing hydrodesulfurization catalysts, 107, 255

H_2

and CO on Pt/TiO₂ surface, analysis of strong metal-support interactions, **104**, 136

on C-supported Fe-Mn and K-Fe-Mn clusters, 103, 450

on γ-Mo₂N, NMR spectroscopy, 108, 50

heptamolybdate ions on γ-Al₂O₃ and TiO₂, **107**, 579 low-temperature, CO on alum-derived active Al₂O₃, IR spectroscopy, **107**, 244

Mo on fluoride-modified Al₂O₃, effect of isoelectric point, **106**, 210

molybdates on γ-Al₂O₃, Mo-95 NMR study, **107**, 154 N₂, for measuring acid-base sites on Al₂O₃, **105**, 536 NO on sulfided Co-Mo hydrodesulfurization catalysts, EPR study, **107**, 587

perylene radicals on Al₂O₃ and SiO₂-Al₂O₃ powders, electron-nuclear double-resonance spectroscopy, **106**, 500

S on Pt surface, effect on catalysis of ethylene hydrogenation reaction, 104, 240

TiO₂ on Pt, role of strong metal-support interactions, 103, 426

¹1 Boldface numbers indicate appropriate volume; lightface numbers indicate pagination.

unsaturated carboxylic acids on γ -Al₂O₃, reactivity with spillover hydrogen, 104, 307

Adsorption isotherms

delaminated clay cracking catalyst, 104, 331

AES, see Auger electron spectroscopy

Agglomeration

high-surface-area solids, 106, 202

Air

graphite oxidation rate, effects of particulate oxides of group IIIB elements, 108, 480

Alcohols

diastereoselective H₂ transfer to ketones over liquid In, 104, 237

Alkali

catalysis of C gasification in CO/CO₂ mixtures, extended model for O₂ exchange and gasification reaction, **107**, 173

promotors on Cs/Ag(111) catalysts, structure, effect of preparation method, 106, 301

Alkaline earths

-promoted Mn/SiO₂ catalysts, oxidative conversion of methane to higher hydrocarbons, 103, 311

Alkaline metals

-promoted Mn/SiO₂ catalysts, oxidative conversion of methane to higher hydrocarbons, 103, 311

salt-catalyzed C gasification by H₂O, D₂O, and CO₂, unification of reaction rates, 107, 209

Alkanes

aromatization reaction scheme in catalytic reforming, letter to editor, 105, 540; reply, 105, 543

Alkenes

reactions on lanthana, 105, 199

Alkylation

toluene with methanol

over alkali cation-exchanged zeolites, in situ IR spectroscopy, 104, 59

over X zeolites in different alkali cation forms, 107, 296

Alkylbenzenes

gas-phase dehydrogenation over Ni/AlPO₄ catalysts, support effects, 107, 181

reaction with deuterium over MoO₃/Al₂O₃ and Al₂O₃ catalysts, 108, 185

Alkyl diarylphosphinites

polymer-bound catalysts, acrylonitrile dimerization, 107, 407

Alloying

and poisoning catalysts, for ensemble control, statistical model

assumptions and derivations, 104, 454

comparison with Monte Carlo simulations and experimental results, 104, 466

Alloys

Ag-Au, ethylene oxidation, 108, 161

amorphous Cu-Zr, activation, 108, 263

crystal surfaces, structure sensitivity in *n*-hexane conversion, 103, 208

formation

over Pt-Sn-Al₂O₃ catalysts, in situ X-ray diffraction, 106, 449

over unsupported Ni-Re catalyst system, effect of CaO, 103, 105

Alum, see Aluminum potassium sulfate

Alumina, see Aluminum oxide

Aluminosilicate

cracking catalysts, interaction with Ni- and VOtetraphenylporphin, 108, 214

Aluminum

-Si high-ratio zeolites, catalytic activities in *n*-heptane cracking, **107**, 288

 -V₂O₅-Al₂O₅-coated catalysts, partial oxidation of 1,3-butadiene

pore length effects on product selectivity, 105, 19 products and reaction routes, 105, 10

Aluminum oxide

acid-base sites, measurement with N₂ adsorption method, **105**, 536

alum-derived, low-temperature CO adsorption, IR spectroscopy, 107, 244

-based oxide supports for CoO combustion catalysts, effect of additives on support surface area, 103, 385

catalysis of deuterium reaction with benzene and alkylbenzenes, 108, 185

chlorinated, support of Ir catalysts, sintering and redispersion, simulation, 103, 140

-Cl, support of Pt catalysts, S-aided metal-support interactions, 106, 73

-Co, reactivity of deposited C, 108, 55

effect on restructuring Fe single crystal surfaces for NH₃ synthesis, **103**, 289

-ethanol-Na₂O-SiO₂-water system, synthesis of ZSM-5 zeolites, 107, 317

-F catalysts, acetylene conversion reactions, 105, 71

-pillared montmorillonite, catalytic activity for trimethylbenzene conversion, effect of spillover hydrogen, 106, 38

∽SiO₂

ratios of faujasite, effect on coke selectivity during fluid catalytic cracking, 106, 410

support of

Pd catalysts, effect on heats of adsorption of H₂, 104, 1

reduced MoO₃ catalysts for ethene and ethane homologation, 106, 354; 108, 143

zeolite catalysts, design for triangular cracking reactions, 106, 116

and SiO2-Al2O3

adsorption of perylene radicals, electron-nuclear double-resonance spectroscopy, 106, 500

support of Pd catalysts for benzene hydrogenation, kinetics, 107, 129

-Sn-Pt catalysts, alloy formation, in situ X-ray diffraction, 106, 449 sphere containing Ni particles, control of impregnation profile, **104**, 323

support of

Ag catalysts, interaction with ethylene-O₂ mixtures, surface-enhanced Raman study, **103**, 188 Co catalysts

Co species distribution, XPS, 103, 151

effect of B on chemical state and dispersion, 104, 396

and Fe, or Ni model catalysts, simulation of supported metal catalysts in real reaction atmospheres, 107, 23

CuO-ZnO catalysts promoted with K₂CO₃, synthesis of higher alcohols, **104**, 434

Fe catalysts, in situ combined TPR and Mössbauer spectroscopy, 106, 440

metallic and oxidic Pt catalysts, *n*-heptane oxidation, **104**, 375

Mo-based hydrodesulfurization catalysts, structural analysis, 105, 277

Mo catalysts

analysis by static secondary ion mass spectroscopy, **105**, 175

CO₂ adsorption, determination of MoS₂ surface coverage, **106**, 65

NiCo-promoted, surface exposure, effect of calcination temperature, 103, 228

MoO3 catalysts

calcination of mechanical mixtures, 105, 445 deuterium reaction with benzene and alkylbenzenes, 108, 185

and MoS₂ catalysts, morphology changes, controlled atmosphere electron microscopy, 105, 299

in oxide and reduced forms, XPS, **104**, 202 skeletal isomerization of hydrocarbons, **104**, 225

vapor pressure measurements, 108, 175

Ni catalysts, deactivation during CO methanation and disproportionation, 107, 275

NiMo catalysts for thiophene hydrodesulfurization, poisoning by V, EPR and metal solid NMR analysis, 106, 525

Ni-W catalysts, aniline hydrodenitrogenation, 105, 254

Pd catalysts

benzene hydrogenation, reaction model, 107, 140

effect on heats of adsorption of H_2 , 104, 1 Pt catalysts

cyclohexane dehydrogenation, effect of sulfur poisoning, 105, 144

ethylene chemisorption, high-resolution solidstate NMR, 108, 15

and Pt-Sn catalysts, adsorption of CO and hydrogenation of benzene, ethylene, and 1-hexene, 103, 249

redispersion by film formation, 108, 77

and Re and PtRe catalysts, isotope exchange and hydrogenolysis of cyclopentane, 106, 417

Re and PtRe catalysts, characterization and catalytic function of Re⁰ and Re⁴⁺, 106, 263

Rh catalysts

adsorption of CO formed during H₂-CO₂ interaction, IR spectroscopy, 104, 312

water-gas shift reaction, kinetic analysis, 106, 458

Rh₂O₃ platelets, electron diffraction and anomalous X-ray diffraction, 106, 549

Ru catalysts

CO hydrogenation, selectivity under transient conditions, 105, 499

EXAFS using synchrotron radiation, 107, 263 and Ru-Mo catalysts, synthesis and XPS, 107, 482

surface area measurements by H₂ chemisorption, effects of adsorbed Cl, **106**, 166, 176

transition metal oxides as acid cracking catalysts, periodic trends and relationship to activity and selectivity, 107, 463

WO₃ catalysts, reduction and metathesis activity, XPS, 107, 522

thin-film support of MoO_3 and MoS_2 catalysts, structural analysis, 103, 366

 $-TiO_2$ and $-TiO_2$ -Co catalysts, characterization, 106, 362

-V₂O₅-Al-coated catalysts, partial oxidation of 1,3butadiene.

pore length effects on product selectivity, **105**, 19 products and reaction routes, **105**, 10

α-Aluminum oxide

-Ag catalysts, ethylene oxidation by N_2O , 104, 156 γ -Aluminum oxide

adsorption of

heptamolybdate ions, 107, 579

molybdates, Mo-95 NMR, 107, 154

unsaturated carboxylic acids, reactivity with spillover hydrogen, 104, 307

-based catalysts containing F, Co, and Mo additives, sulfidation effects, 106, 544

fluoride-modified, Mo adsorption, effect of isoelectric point, 106, 210

reaction with CO, synthesis of surface formate, 105, 366

support of

monometallic and bimetallic transition metal catalysts, functional selectivity for C-O hydrogenolysis, 104, 413

Ni catalysts

formation of SO₂ and SO₄ radicals, ESR, 103, 506

interaction during deposition from aqueous solution, 104, 86

NiO catalysts, in situ laser Raman spectroscopy, 103, 224

Pd-Ag catalysts, synergism in methanol and CO oxidation, 103, 419

Pt catalysts, and as diluent, cooperative action in benzene hydrogenation, 108, 294

η-Aluminum oxide

-SiO₂, support of Pd catalysts, effect on heats of adsorption of CO, 104, 17

support of Pd catalysts

benzene hydrogenation, kinetics, 107, 129 effect on heats of adsorption of CO, 104, 17

Aluminum phosphate

catalytic materials, thermal and structural stability, compositional effects, 105, 521

-SiO₂, support of Pd catalysts, cyclohexene gasphase disproportionation, optimization, 108, 487

support of Ni catalysts, effect on gas-phase dehydrogenation of alkylbenzenes, 107, 181

Aluminum potassium sulfate

-derived active Al₂O₃, low-temperature CO adsorption, IR spectroscopy, 107, 244

Ammonia

decomposition on Fe(110) surface, AES, 108, 484 in HCN synthesis over Pt foil, 104, 441

interaction with MgO-CoO solid solution surfaces, IR spectroscopy, 103, 270

reaction with methanol on Na-mordenite, synthesis and equilibration of methylamines, 103, 20

reduction with NO_x over MoO₃ catalysts, effect of catalyst grain morphology, 103, 394

synthesis catalyst, mechanism of formation, 103, 1 synthesis over Fe catalysts

prepared from amorphous Fe₉₁Zr₉ precursor bulk structural and surface chemical changes, 107, 221

kinetics, 108, 467

surface morphological changes, 108, 452 role of C₇ sites and surface roughness, 103, 213 as single crystals, surface restructuring, effects of Al₂O₃ and K₂O, 103, 289

Ammoxidation

toluene

over V₂O₅/TiO₂ catalysts prepared by flash-drying, characterization, **106**, 251

over V-TiO₂ catalysts in flow reactor, FTIR spectroscopy, **106**, 471

Amylene

synthesis over sulfonic acid resin catalyst in acetone environment, thermodynamics and kinetics, 103, 177

Anatase, see Titanium dioxide, anatase

Aniline

hydrodenitrogenation over Ni-W/Al₂O₃, **105**, 254 Annealing

internal silanol groups in ZSM-5 by steaming, letter to editor, 104, 484

Antimonate

rutile-structure, as selective oxidation catalyst for 1-

butene conversion to butadiene, preparation and characterization, 103, 357

Antimony

dopant for Pt/TiO₂ catalysts, effect on chemisorptive behavior, 103, 320

excess amounts in FeSbO₄ catalysts for 1-butene conversion to butadiene, preparation and characterization, 103, 357

-Fe-Ti-O catalysts, propylene oxidation to acrolein, 107, 307

-impregnated catalysts, for selective oxidation of 1butadiene and CO, 104, 47

Aromatization

alkanes, reaction scheme in catalytic reforming, letter to editor, 105, 540; reply, 105, 543

3-methylpentane over Ni catalysts, mechanism, 105, 65

Auger electron spectroscopy

ammonia decomposition over Fe(110) surface, 108, 484

В

Basicity

surface, role in cyclohexane dehydrogenation and isomerization over TiO₂-ZrO₂-V₂O₅ ternary oxides, **107**, 195

Benzene

adsorption and hydrogenation on Pt/Al₂O₃ and Pt-Sn/Al₂O₃ catalysts, **103**, 249

hydrogenation over

Ni catalysts, steady-state and isotopic transient kinetics, 105, 405

Pt/γ-Al₂O₃ and diluent γ-Al₂O₃ catalyst mixtures, cooperative action, 108, 294

supported and unsupported Pd catalysts kinetics, 107, 129

reaction model, 107, 140

unsupported Ni-Re catalyst system, effect of CaO, 103, 105

reaction with deuterium over MoO₃/Al₂O₃ and Al₂O₃ catalysts, 108, 185

Benzoic acid

adsorption on γ-Al₂O₃, reactivity with spillover hydrogen, **104**, 307

Bismuth

-Fe-Mo oxide catalysts, ⁵⁷Fe Mössbauer spectroscopy and electron microscopy, 104, 164

Bismuth molybdenum oxide

reduction and reoxidation behavior, 108, 247

Book review:

Catalytic Hydrogenation. L. Červený (Ed.), Studies in Surface Science and Catalysis, Vol. 27. 1986, 106, 327

Chemistry and Physics of Solid Surfaces VI. R. Vanselow and R. Howe (Eds.), 1986, 107, 591 Metal Clusters in Catalysis. B. C. Gates, L. Guczi,

and H. Knozinger (Eds.), 1986, 107, 591

New Developments in Zeolite Science and Technology. Y. Murakami, A. Iijima, and J. W. Ward (Eds.), Studies in Surface Science and Catalysis, Vol. 28. 1986, 106, 327

Boron

effect on chemical state and dispersion of Co/Al₂O₃ catalysts, **104**, 396

Ni amorphous films, O₂-treated, surface characterization, 108, 256

-Rh cluster anion and rare earth cations, metal cluster compounds, catalysis of heterogeneous olefin hydrogenation, 106, 292

-substituted ZSM-5 and ZSM-11 zeolites, properties, 108, 1

1,3-Butadiene

formation from 1-butene

over FeSbO₄ catalysts containing excess Sb, 103, 357

by selective oxidation over $MSbO_4$ catalysts (M = Fe,Al,Cr,Co,Rh), 104, 47

hydrogenation over

Pt(110) single crystals, mechanism and C deactivation, 107, 434

sulfur-poisoned Pt(110) single crystals, 107, 445 partial oxidation over V₂O₃/Al₂O₃/Al-coated catalysts

pore length effects on product selectivities, 105, 19

products and reaction routes, 105, 10

Butane

cracking over gallosilicate molecular sieve, role of framework and nonframework Ga, 106, 287

hydrogenolysis over activated carbon-supported Pt catalysts, 107, 1

isomerization over activated C-supported Pt catalysts, 107, 1

oxidative dehydrogenation over V-Mg-O catalysts, 105, 483

reaction with deuterium over lanthana catalysts at high temperature, 107, 424

1-Butanol, see n-Butyl alcohol

2-Butanol, see sec-Butyl alcohol

1-Butene

conversion to butadiene over FeSbO₄ catalysts containing excess Sb, 103, 357

effect on CO hydrogenation over Ru/SiO₂ catalysts, 108, 63

hydrogenation over pumice-supported monodisperse colloidal metal particle catalysts, 103, 95

isomerization over α -Zr(HPO₄)₂·H₂O and some derived phases, 103, 346

oxidation over MoO₃ catalysts, determination of reaction active sites, 106, 188

reaction on lanthana, 105, 199

selective oxidation to butadiene over MSbO₄ catalysts (M = Fe,Al,Cr,Co,Rh), 104, 47

2-Butene

reaction on lanthana, 105, 199

n-Butyl alcohol

adsorption on H-ZSM-5, IR spectroscopy, 105, 455 dehydration over α-Zr(HPO₄)₂·H₂O and some derived phases, 103, 346

electrocatalytic oxidation on Au electrodes, 104, 37 sec-Butyl alcohol

dehydration over α-Zr(HPO₄)₂·H₂O and some derived phases, **103**, 346

electrocatalytic oxidation on Au electrodes, 104, 37 tert-Butyl alcohol

adsorption on H-ZSM-5, IR spectroscopy, **105**, 455 electrocatalytic oxidation on Au electrodes, **104**, 37 Butylamines

n-, sec-, and tert-, deamination on protonic centers of H-Na-Y zeolite, mechanism, 104, 31

C

Cadmium

catalysts for CO hydrogenation and isoparaffin synthesis, 103, 512

Calcination

mechanical mixtures of MoO₃ with various oxide supports, **105**, 445

temperature, effect on surface exposure of NiCo promoters in Mo/Al₂O₃ catalysts, **103**, 228

Calcium hydroxide

-catalyzed condensation of methylene glycol, effects of oxygen and reducing sugars, 103, 239

Calcium oxide

effect on catalytic activity of unsupported Ni-Re catalysts, 103, 105

Calorimetry

heat-flow, H₂ and CO adsorption on Pt/TiO₂ surface, in analysis of strong metal-support interactions, 104, 136

Carbon

activated, support of

Mo-based hydrodesulfurization catalysts, structural analysis, 105, 277

Pt catalysts, isomerization and hydrogenolysis of *n*-butane, **107**, 1

alkali-catalyzed gasification

in CO/CO₂ mixtures: extended model for O₂ exchange and gasification reaction, **107**, 173

by H₂O, D₂O, and CO₂, unification of reaction rates, **107**, 209

deactivation during 1,3-butadiene hydrogenation over Pt(110) single crystals, 107, 434

deposition on Co-Al₂O₃ catalysts, reactivity, 108, 55

-D interaction on Ru(001) surface, 105, 55

O hydrogenolysis over γ-Al₂O₃-supported monometallic and bimetallic transition metal catalysts, functional selectivity, 104, 413

support of

Fe-Mn and K-Fe-Mn catalysts chemisorption and catalytic behavior, 103, 450

olefin synthesis from CO and H₂, activity and selectivity maintenance and regenerability, **105**, 155

Pt catalysts

hydroxylamine formation by nitric oxide hydrogenation in sulfuric acid, **106**, 494

reaction with nitric oxide, N₂ desorption, 105, 263

Carbon dioxide

adsorption over Mo/Al₂O₃ catalysts, determination of MoS₂ surface coverage, **106**, 65

-CO

alkali-catalyzed C gasification: extended model for O₂ exchange and gasification reaction, 107, 173

-H₂, formation of methanol over Cu-Zn-based catalysts, reaction rates, 107, 161

interconversion and adsorption/desorption rates over chromia-promoted magnetite, isotopic exchange measurements, implications for watergas shift, 103, 65

and H₂ interaction over Rh/Al₂O₃, CO formation, IR spectroscopy, **104**, 312

and H_2O and D_2O , alkali-catalyzed carbon gasification, unification of reaction rates, 107, 209

hydrogenation over

La_{1-y}M_yCoO₃ perovskite (M = Sr,Th), 105, 107 Rh/Nb₂O₅ or Cu/SiO₂-Rh/Nb₂O₅ catalysts at atmospheric pressure, 104, 339

methanation over Co catalysts, activating effect of catalyst pre-oxidation, 106, 144

photoassisted reduction by H₂ over metal oxides, effect of water vapor, **104**, 246

Carbon monoxide

adsorbed intermediate in formaldehyde oxidation over Pt/SiO₂ catalyst, 105, 258

adsorption on

K-promoted Rh/SiO₂ catalysts, 105, 432

Pt/Al₂O₃ and Pt-Sn/Al₂O₃ catalysts, 103, 249

Pt/TiO₂ surface, analysis of strong metal-support interactions, **104**, 136

Re⁰ and Re⁴⁺ in Re/Al₂O₃ and PtRe/Al₂O₃ catalysts, **106**, 263

Rh/Al₂O₃ during H₂-CO₂ interaction, IR spectroscopy, **104**, 312

catalytic oxidation over PrO_x, role of lattice oxygen atoms, 105, 525

chemisorption on

MnO_x-modified Ni(111) surfaces, 106, 369

Pt-WO₃-SiO₂ catalysts, 107, 114

Ru/SiO₂ catalysts, effects of reduction temperature and Cl, 103, 492

-CO₂

-H₂, formation of methanol over Cu-Zn-based catalysts, reaction rates, **107**, 161

interconversion and adsorption/desorption rates over chromia-promoted magnetite, isotopic exchange measurements, implications for watergas shift, 103, 65 mixtures, alkali-catalyzed C gasification, extended model for O₂ exchange and gasification reaction, **107**, 173

dissociation and C-D interaction on Ru(001) surface, 105, 55

$-H_2$

interactions with Pd/SiO₂, dispersion effects, 103, 46

mixtures for synthesis of light olefins over Co-Th catalysts at atmospheric pressure, 105, 1

for olefin synthesis over C-supported Fe-Mn and K-Fe-Mn clusters, chemisorption and catalytic behavior, 103, 450

in synthesis of oxygenates over supported metal clusters, 106, 323

heats of adsorption on Pd catalysts, effects of crystallite size and support, 104, 17

homogeneous hydrogenolysis over Ru carbonyl/ halide catalysts, aldehyde intermediates, 105, 478

hydrogenation, isotopic tracer studies, analysis of transient response data, 104, 147

hydrogenation over

Cd catalysts, isoparaffin synthesis, 103, 512

Co-Y zeolite catalysts, metal loading effects, 106, 386

Mo₂C and Mo₂N catalysts with hexagonal close packing and face-centered cubic symmetries, 108, 40

Rh catalysts, analysis using isotopic tracers, 106, 464

Rh foil, enhancement by TiO_x overlayers, **106**, 401 Ru/Al₂O₃, selectivity under transient conditions, **105**, 499

Ru/SiO₂ catalysts, effect of

 C_4H_8 , 108, 63

propylene, 107, 338

zeolite-supported metal catalysts, secondary reactions, effect of alkali cations, 107, 471

induction of Rh aggregate/Rh-Y disintegration and in situ synthesis of Rh carbonyl clusters, 104, 279

isotopic exchange over Cu catalysts, 108, 250

low-temperature adsorption on alum-derived active Al₂O₃, IR spectroscopy, 107, 244

methanation and disproportionation, associated deactivation of Ni-based catalysts, 107, 275

methanation over FeTi_{1+x} intermetallics, **107**, 510 in methanol deoxygenation over Fe-ZSM-5 catalysts, **103**, 480

oxidation over

Cu-mordenite

diffusion limitations, 103, 204

reaction kinetics and mechanism, 104, 176

Pd-Ag/Al₂O₃ catalysts, synergistic interactions between metal components, 103, 419

Pt/TiO₂ catalysts, effects of TiO₂ crystal phases, FTIR spectroscopy, 105, 386

photoreduction of Mo/SiO₂ catalysts, 107, 8

reaction with γ -Al₂O₃ and MgO, synthesis of surface formate, 105, 366

selective oxidation over $MSbO_4$ catalysts (M = Fe,Al,Cr,Co,Rh), 104, 47

Carbonylation

reductive, ethanol over homogeneous Co-Ru catalysts, 103, 37

Carbonyl clusters

Rh, CO-induced synthesis in situ from Rh aggregate/ Rh-Y, 104, 279

Carburization

Fe catalyst in Fischer-Tropsch synthesis, effect on catalytic activity, 107, 82

Cations

alkali, effect on secondary reactions during CO hydrogenation over zeolite-supported metal catalysts, 107, 471

exchange, effect on coke selectivity during fluid catalytic cracking over faujasite, **106**, 410

induction of Brønsted and Lewis acid sites on silica surface, 105, 285

Cerium

-Cu alloy precursors for methanol synthesis catalysts, activation and performance, 106, 216

Cerium dioxide

crystallite size, TPR, 103, 502

Cesium

Ag(111)-supported catalysts with alkali promotors, structure, effect of preparation method, 106, 301

promotor, effect on ethylene oxide adsorption, isomerization, and combustion over Ag(111) catalysts, 106, 54

V-supported catalysts, SO₂ oxidation

kinetics, comparison with K/V catalysts, 103, 126 at low temperatures, rate limiting factors, 104, 186 Charcoal

support of Pt catalysts for hydrogenation of NO in sulfuric acid, microstructural study, 106, 483

Chemisorption

CO on

C-supported Fe-Mn and K-Fe-Mn clusters, 103, 450

MnO_x-modified Ni(111) surfaces, **106**, 369 Pt-WO₃-SiO₂ catalysts, **107**, 114

ethylene on Al_2O_3 - or SiO_2 -supported Pt catalysts, high-resolution solid-state NMR, 108, 15

H₂ on

highly dispersed Ir, Pt, and Rh catalysts, particle size determination, 105, 26

Ru/Al₂O₃ catalysts, surface area determination, effect of

adsorbed Cl, 106, 166

adsorbed Cl and crystallite size, 106, 176

tungsten carbide, effects of surface composition, 103. 30

H₂ and O₂ on cation-doped Pt/TiO₂ catalysts, role of dopant-induced metal-support interactions, 103, 320 H₂, O₂, and CO on Ru/SiO₂ catalysts, effects of reduction temperature and Cl, 103, 492

oxygen on V_2O_5 , kinetics, 107, 503

Chlorine

adsorption on Ru/Al₂O₃ catalysts, effect on surface area determination by H₂ chemisorption, **106**, 166, 176

-Al₂O₃, support of Pt catalysts, S-aided metal-support interactions, 106, 73

promotor, effect on ethylene oxide adsorption, isomerization, and combustion over Ag(111) catalysts, 106, 54

and reduction temperature, effects on chemisorptive properties of Ru/SiO₂ catalysts, **103**, 492

2-Chloro-3-butanone

oxyhydrative scission over V₂O₅-MoO₃ catalyst, **104**, 359

1-Chloro-2-butene

oxyhydrative scission over V₂O₅-MoO₃ catalyst, **104**, 359

Chromatography

reactive frontal, measurement of Cu surface area, 103, 79

Chromia

-promoted magnetite catalysts, CO and CO₂ interconversion and adsorption/desorption rates, isotopic exchange measurements, implications for water-gas shift, 103, 65

Chromic oxide

support of CuO-ZnO catalysts promoted with K₂CO₃, synthesis of higher alcohols, **104**, 434 Chromium(III) acetate

modified, polymerization of α -olefins, 105, 249 Clay

cracking catalyst, delaminated, physicochemical properties, 104, 331

Cobalt

additive in γ-Al₂O₃-based catalysts, sulfidation effects, **106**, 544

-Al₂O₃-supported catalysts

Co species distribution, XPS, 103, 151

effect of B on chemical state and dispersion, 104, 396

reactivity of deposited carbon, 108, 55

simulation of supported metal catalysts in real reaction atmospheres, 107, 23

-Al₂O₃-TiO₂ catalysts, characterization, 106, 362
 -containing dispersed zeolite Fischer-Tropsch catalysts, characterization, 106, 47

 -Fe model catalysts supported on magnesium hydroxide carbonate, Mössbauer spectroscopy, 108, 112

La_{1 - y} M_y CoO₃ perovskites (M = Sr, Th) bulk and surface reduction studies, **105**, 95

CO₂ hydrogenation activity, **105**, 107

 -La intermetallic catalysts, electron microscopy, 105, 120

-Mo sulfided hydrodesulfurization catalysts, effect of NO adsorption, EPR, 107, 587

- -Ni promoters for Mo/Al₂O₃ catalysts, surface exposure, effect of calcination temperature, 103, 228
- -Ru catalysts, reductive carbonylation of ethanol, 103, 37
- support of CO₂ methanation, activating effect of catalyst pre-oxidation, 106, 144
- -Th catalysts for synthesis of light olefins from CO-H₂ mixtures at atmospheric pressure, 105, 1
- Y zeolite-supported catalysts, CO hydrogenation, metal loading effects, 106, 386

Cobaltous oxide

- -MgO solid solutions, surface interaction with NH₃ and O₂, IR spectroscopy, 103, 270
- -MoO₃ hydrodesulfurization catalyst supported over TiO₂-ZrO₂, evaluation, 108, 401
- oxide-supported catalysts for combustion, effect of additives on support surface area, 103, 385

Coke

selectivity during fluid catalytic cracking over faujasite, effect of catalyst composition, **106**, 410

Combustion

- catalysts, supported by Al₂O₃-, MgO-, and ZrO₂based oxides, effect of additives on support surface area, **103**, 385
- ethylene oxide over Ag(111) catalysts, effects of Cl and Cs promotors, 106, 54

Condensation

aldol, vapor-phase, between formaldehyde and acetone, production of methyl vinyl ketone, 106, 273

methylene glycol

calcium hydroxide-catalyzed, effects of oxygen and reducing sugars, 103, 239

volume changes during, 103, 474

vapor-phase aldol-type, formaldehyde with acetic acid over V₂O₅-P₂O₅ catalysts, 107, 201

Contact masses

direct process, XPS, letter to editor, 103, 232; reply, 103, 236

Copper

catalysts, isotopic exchange of CO, 108, 250

- -Ce and -Nd alloy precursors for methanol synthesis catalysts, activation and performance, 106, 216
- Cu(II) chelates and Cu(II)-poly(vinylpyridine) complexes, as catalysts for 3,5-di-tert-butylcatechol oxidation, 108, 369
- Cu(111) surface, water-gas shift reaction kinetics, 104, 109
- -Ru(0001) surface, cyclohexane hydrogenolysis and dehydrogenation, kinetics, 104, 347

SiO₂-supported catalysts

CO₂ hydrogenation at atmospheric pressure, 104, 339

dispersion, analysis by ⁶³Cu NMR, **107**, 583 prepared by ion-exchange technique, structure, **108**, 323

- surface area, measurement by reactive frontal chromatography, 103, 79
- ZnO-supported catalysts, formaldehyde conversion to methanol and methyl formate, 105, 352
- -Zr alloys, amorphous, activation, 108, 263

Copper aluminate

catalytic site structure, comparison with copper chromites, 107, 375

Copper chromite

catalytic site structure, comparison with copper aluminate, 107, 375

Copper mordenite

CO oxidation

diffusion limitations, 103, 204

reaction kinetics and mechanism, 104, 176

Cracking gas-oil over

- Al₂O₃-supported transition metal oxide catalysts, periodic trends and relationship to activity and selectivity, 107, 463
- Y zeolites, effects of dealumination by various methods, 108, 135

n-heptane

deactivation of H-Y zeolite, 106, 235

deactivation modes of zeolites, comparisons, 106, 242

paraffins over H-Y zeolites

hydrogen transfer reactions, 107, 451

reaction kinetics, 104, 80

- primary and secondary analysis, assessment of diffusional inhibition, 106, 105
- triangular reactions, design of zeolite/SiO₂-Al₂O₃ catalysts, **106**, 116

Crystal face

MoO₃ catalysts, role in oxidation of propene, 104, 71 Crystallites

CeO₂, size, TPR, 103, 502

- Pd, O₂ heats of adsorption measurements, effects of size and support, 105, 342
- Ru/Al₂O₃ catalysts, size effect on surface area determination by H₂ chemisorption, 106, 176

Crystal phases

TiO₂, effect on CO oxidation over Pt/TiO₂ catalysts, FTIR spectroscopy, **105**, 386

Crystal size

Pd catalysts, effect on heats of adsorption of CO, 104, 17

H₂, 104, 1

Crystal structure

Fe, effect on activity in steam gasification, **104**, 233 Cumene

conversion over γ -Al₂O₃-based catalysts containing F, Co, and Mo additives, sulfidation effects, 106, 544

Cupric oxide

Al₂O₃-, Cr₂O₃-, or ThO₂-supported catalysts promoted with K₂CO₃, synthesis of higher alcohols, **104**, 434

-ZnO catalysts supported on Al₂O₃, Cr₂O₃, or ThO₂ and promoted with K₂CO₃, synthesis of higher alcohols, 104, 434

Cyclohexane

dehydrogenation

and hydrogenolysis over Ru(0001) and Cu/Ru(0001) surfaces, kinetics, 104, 347

and isomerization over TiO₂–ZrO₂–V₂O₅ ternary oxides, role of surface acidity and basicity, **107**, 195

over Pt/Al₂O₃ catalysts, effect of sulfur poisoning, **105**, 144

over unsupported Ni-Re catalyst system, effect of CaO, 103, 105

Cyclohexanone

oxyhydrative scission over V₂O₅-MoO₃ catalyst, 104, 359

Cyclohexene

gas-phase disproportionation over Pd/SiO₂-AlPO₄, optimization, **108**, 487

liquid phase hydrogenation over Ni catalysts, 106,

oxyhydrative scission over V₂O₅-MoO₃ catalyst, 104, 359

Cyclohexene carbonic acid

adsorption on γ-Al₂O₃, reactivity with spillover hydrogen, **104**, 307

Cyclooctane

catalytic reactions on H-Y zeolite, 107, 571

Cyclopentane

exchange with D₂ over metal catalysts, NMR spectroscopy, **104**, 480

hydrogenolysis over Al₂O₃- or SiO₂-supported Pt, Re, and PtRe catalysts, **106**, 417

Cyclopentanone

oxyhydrative scission over V₂O₅-MoO₃ catalyst, **104**, 359

Cyclopentene

reaction on lanthana, 105, 199

Cyclopropane

reactions with H₂ over supported Ru catalysts, structure sensitivity, **108**, 495

D

Deactivation

catalysts by site coverage through multi-site reaction mechanisms, 108, 271

H-Y zeolite during *n*-heptane cracking, 106, 235 zeolites during *n*-heptane cracking, mode comparisons, 106, 242

Dealumination

Y zeolites, effect on catalytic activity for gas-oil cracking, 108, 135

Deamination

n-, sec-, and tert-butylamines on protonic centers of H-Na-Y zeolite, mechanism, 104, 31

Decanal

decomposition over Ni- and H-ZSM-5, **103**, 87 1-Decanol, *see n*-Decyl alcohol

Decomposition

ammonia on Fe(110) surface, AES, 108, 484 decanal and 1-decanol over Ni- and H-ZSM-5, 103,

N₂O over

Ag(111) surface, 104, 156

Si-substituted Fe-exchanged Y zeolite, 104, 381 -reduction, effect on Ru particle size in Ru/zeolite

-reduction, effect on Ru particle size in Ru/zeolite catalysts, 106, 318

n-Decyl alcohol

decomposition over Ni- and H-ZSM-5, 103, 87

Dehydration

alcohols over α -Zr(HPO₄)₂·H₂O and some derived phases, **103**, 346

ethanol, transient behavior on/in heteropoly compounds, 106, 329

Dehydrogenation

C₂H₆ over SiO₂- and SiO₂-Al₂O₃-supported reduced MoO₃ catalysts, **108**, 143

cyclohexane over

Pt/Al₂O₃ catalysts, effect of S poisoning, 105, 144 Ru(0001) and Cu/Ru(0001) surfaces, kinetics, 104, 347

TiO₂-ZrO₂-V₂O₅ ternary oxides, role of surface acidity and basicity, **107**, 195

unsupported Ni-Re catalyst system, effect of CaO, 103, 105

gas-phase, alkylbenzenes over Ni/AlPO₄ catalysts, support effects, 107, 181

oxidative, butane over V-Mg-O catalysts, **105**, 483 Deoxygenation

methanol with CO over Fe-ZSM-5 catalysts, 103, 480

Deposition

C on Co-Al₂O₃ catalysts, reactivity, 108, 55

Ni/y-Al₂O₃ from aqueous solution, catalyst-support interactions during, **104**, 86

Desorption

 -adsorption of CO and CO₂ over chromia-promoted magnetite, isotopic exchange measurements, implications for water-gas shift, 103, 65

N₂, in reaction of nitric oxide over Pt/C catalysts, **105**, 263

Deuterium

-C interaction on Ru(001) surface, 105, 55

exchange with cyclopentane over metal catalysts, NMR spectroscopy, 104, 480

-H₂ exchange

over Al₂O₃- or SiO₂-supported Pt, Re, and PtRe catalysts, **106**, 417

induction by H₂ spillover on SiO₂, **104**, 288 reaction over Pd catalysts, **107**, 589

reactions with

alkanes over lanthana catalysts at high temperature, 107, 424 benzene and alkylbenzenes over Al₂O₃ and MoO₃/Al₂O₃ catalysts, 108, 185

regioselective isotopic exchange with propane over illuminated Pt/TiO₂ catalyst below room temperature, 108, 426

Deuterium oxide

and CO₂ and H₂O, alkali-catalyzed C gasification, unification of reaction rates, 107, 209

Deuterodesulfurization

thiophene over MoS₂ and reduced molybdenum sulfide catalysts, reaction mechanism, 103, 261

3,5-Di-tert-butylcatechol

oxidation over homogeneous Cu(II) chelates and Cu(II)-poly(vinylpyridine) complexes, 108, 369 Diffusion

in CO oxidation over Cu-mordenite catalysts, limitations, 103, 204

oxygen in Mo₂C, TPD and TPR, 107, 393

TiO₂ on Pt, role of strong metal-support interactions, **103**, 426

Diffusional inhibition

assessment through primary and secondary cracking analysis, 106, 105

Dimerization

acrylonitrile over polymer-bound catalysts, **107**, 407 ethylene over supported titanium alkoxides, **105**, 187

Dimethylamine

synthesis and equilibration on Na-mordenite, 103, 20

2,3-Dimethylbut-1-ene

reaction on lanthana, 105, 199

3,3-Dimethylbut-1-ene

reaction on lanthana, 105, 199

2,2-Dimethylpropane, see Neopentane

Direct process

contact masses, XPS, letter to editor, **103**, 232; reply, **103**, 236

Dispersion

Cu/SiO₂ catalysts, analysis by ⁶³Cu NMR, **107**, 583 effect on interactions of H₂ and CO with Pd/SiO₂, **103**, 46

Disproportionation

CO, associated deactivation of Ni-based catalysts,

gas-phase, cyclohexene over Pd/SiO₂-AlPO₄, optimization, **108**, 487

Dissociation

heterolytic, H₂ over high-temperature methanol synthesis catalysts, **108**, 491

Dodecane

cracking over H-Y zeolite, hydrogen transfer reactions, 107, 451

E

Electrodes

Au, electrocatalytic oxidation of saturated oxygenated compounds, 104, 37 Electron diffraction

microdiffraction patterns of Au-Ru catalyst particles, 108, 199

Rh₂O₃ platelets on Al₂O₃, 106, 549

Electron microscopy

Bi-Fe-Mo oxide catalysts, 104, 164

controlled atmosphere, changes in morphology of MoO₃ and MoS₂ supported on Al₂O₃ and graphite, **105**, 299

high-resolution, see High-resolution electron microscopy

LaCo₅ intermetallic catalysts, 105, 120

Electron paramagnetic resonance

effect of NO adsorption on sulfided Co-Mo hydrodesulfurization catalysts, 107, 587

hydrodesulfurization poisoning by V compounds, 106, 525

Electron spin resonance

Re⁰ and Re⁴⁺ in Re/Al₂O₃ and PtRe/Al₂O₃ catalysts, 106, 263

SiO₂-supported FeRu and FePt catalysts, **108**, 259 SO₂ and SO₄ radical formation on Ni/γ-Al₂O₃ catalysts, **103**, 506

Energy distribution

crystalline AlPO₄-5 molecular sieve, **103**, 115 Epoxidation

ethylene over Ag catalyst, unsteady and steady state kinetics, 105, 81

EPR, see Electron paramagnetic resonance

ESR, see Electron spin resonance

Ethane

homologation, hydrogenolysis, and dehydrogenation over SiO₂- and SiO₂-Al₂O₃-supported reduced MoO₃ catalysts, 108, 143

hydrogenolysis over

Mo₂C and Mo₂N catalysts with hexagonal close packing and face-centered cubic symmetries, 108, 40

unsupported Ni-Re catalyst system, effect of CaO, 103, 105

Ethanol

adsorption on H-ZSM-5, IR spectroscopy, 105, 455

dehydration, transient behavior on/in heteropoly compounds, 106, 329

electrocatalytic oxidation on Au electrodes, 104, 37

induction of oxygenate formation during Fischer-Tropsch synthesis, **105**, 335

reductive carbonylation over homogeneous Co-Ru catalysts, 103, 37

synthesis over promoted Cu catalysts, 104, 434 as template in ZSM-5 zeolite synthesis, 107, 317

Ethene, see Ethylene

N-Ethylaniline

formation of indole over poly(platinum phthalocyanine) catalyst, 107, 240

Ethylation

toluene on ZSM zeolites, 105, 227

Ethylbenzene

hydrogenolysis over Ni/Al₂O₃ catalyst derived from Ni hydroaluminate, **105**, 469

Ethylcyclohexane

catalytic reactions on H-Y zeolite, 107, 571

Ethylene

adsorption and hydrogenation on Pt/Al₂O₃ and Pt-Sn/Al₂O₃ catalysts, 103, 249

chemisorption on Al₂O₃- or SiO₂-supported Pt catalysts, analysis by high-resolution solid-state NMR, 108, 15

conversion to higher hydrocarbons over ZSM-5 catalysts, 105, 270

dimerization over supported Ti alkoxides, 105, 187 epoxidation over Ag catalyst, unsteady and steady state kinetics, 105, 81

homologation over

SiO₂-Al₂O₃-supported reduced MoO₃ catalysts, kinetics and catalytic studies, **106**, 354

supported MoO₃ catalysts, effects of catalyst support and pretreatment, **105**, 530

hydrogenation

induction by H₂ spillover on SiO₂, 104, 288 over Pt surface, effect of adsorbed S, 104, 240

H-ZSM-5-catalyzed formation from methanol or higher olefins, letter to editor, 103, 524; response, 103, 526

-O₂ mixtures, interaction with supported Ag catalysts, surface-enhanced Raman study, 103, 188 oxidation over

Ag-Au alloy catalysts, 108, 161

O₂-preconditioned Ag foil, kinetics, 105, 39

production during methanol conversion over H-ZSM-5, ³H NMR, **108**, 153

reaction on lanthana, 105, 199

Ethylene glycol

electrocatalytic oxidation on Au electrodes, 104, 37 intermediate in CO homogeneous hydrogenolysis over Ru carbonyl/halide catalysts, 105, 478

Ethylene oxide

adsorption

isomerization, and combustion over Ag(111) catalysts, effects of Cl and Cs promotors, 106, 54 and polymerization on MgO, IR spectroscopy, 104, 299

EXAFS, see Extended X-ray absorption fine structure Extended X-ray absorption fine structure

highly dispersed Rh, Ir, and Pt catalysts, in particle size determination, 105, 26

Ru/Al₂O₃ catalysts using synchrotron radiation, **107**, 263

F

Ferrosoferric oxide

chromia-promoted catalysts, CO and CO₂ interconversion and adsorption/desorption rates, isotopic exchange measurements, implications for water-gas shift, 103, 65

reduction by H₂, formation of ammonia synthesis catalyst, 103, 1

Films

amorphous Ni-B, O₂-treated, surface characterization, 108, 256

formation, redispersion of Pt/Al₂O₃ catalysts, 108,

thin

Al₂O₃, support of MoO₃ and MoS₂ catalysts, structural analysis, 103, 366

Nb₂O₅-SiO₂ surface oxides, morphology and structure, **108**, 383

Fischer-Tropsch catalysts

support of HCN reaction with H₂, hydrocarbon formation, **106**, 337

zeolite, dispersed Co-containing, characterization, 106, 47

Fischer-Tropsch synthesis

ethanol-induced oxygenate formation during, 105, 335

Fe carbides, Mössbauer spectroscopy, effect of particle size and structure, 104, 365

Fe catalyst, effect of carburization on catalytic activity, 107, 82

Fe/MnO catalysts, physical and catalytic characterization, 105, 319

on metal powder catalysts prepared by K reduction of halides in THF, 105, 359

two-site and distributed-site models, differentiating criteria, 105, 266

Flash-drying

preparation of V₂O₃/TiO₂ catalysts for toluene ammoxidation, catalyst characterization, **106**, 251

Flow reactor

toluene oxidation and ammoxidation over V-TiO₂ catalysts, FTIR spectroscopy, **106**, 471

Fluorine

additive in γ-Al₂O₃-based catalysts, sulfidation effects, **106**, 544

-Al₂O₃ catalysts, acetylene conversion reactions, 105, 71

 -modified Al₂O₃, Mo adsorption, effect of isoelectric point, 106, 210

Formaldehyde

and acetone, vapor-phase aldol condensation, production of methyl vinyl ketone, 106, 273

conversion to methanol and methyl formate over Cu/ZnO catalysts, 105, 352

formation from methanol by oxidation over Mo/ SiO₂, **103**, 55

intermediate in CO homogeneous hydrogenolysis over Ru carbonyl/halide catalysts, 105, 478

and isobutene, vapor-phase Prins reaction, production of isoprene, 106, 280

oxidation over Pt/SiO₂ catalysts, evidence for CO intermediate, 105, 258

synthesis by catalytic partial oxidation of methane, 108, 252

vapor-phase aldol condensation with acetic acid over V₂O₅-P₂O₅ catalysts, 107, 201

Formate

surface, synthesis from direct reaction of CO with γ -Al₂O₃ and MgO, 105, 366

Formic acid

deuterated, TPD over Ni/SiO₂ catalysts, **104**, 424 Formose reaction

effects of oxygen and reducing sugars, 103, 239 volume changes of methylene glycol, 103, 474

Fourier transform-infrared spectroscopy

CO over Pt/TiO₂ catalysts, effects of TiO₂ crystal phases, 105, 386

scanning, analysis of H₂ spillover from point source onto SiO₂, 106, 378

sulfated silica, 107, 232

toluene oxidation and ammoxidation over V-TiO₂ catalysts in flow reactor, **106**, 471

FTIR, see Fourier transform-infrared spectroscopy

G

Gallium

framework and nonframework, role in catalytic cracking activity, 106, 287

Gas

-oil cracking over

Al₂O₃-supported transition metal oxide catalysts, periodic trends and relationship to activity and selectivity, **107**, **463**

Y zeolites, effects of dealumination by various methods, 108, 135

 -oil hydrodesulfurization over Mo and Ni catalysts, kinetics and mechanism, 107, 255

-water shift

for chromia-promoted magnetite, implications from isotopic exchange measurements of CO and CO₂ interconversion and adsorption/desorption rates, 103, 65

over Cu(111) surface, reaction kinetics, 104, 109 over Rh/Al₂O₃ catalysts, kinetic analysis, 106, 458

Gasification

alkali-catalyzed, C in

CO/CO₂ mixtures: extended model for O₂ exchange and gasification reaction, **107**, 173

H₂O, D₂O, and CO₂, unification of reaction rates, **107**, 209

steam, activity of Fe in, effect of crystal structure, 104, 233

Germanium

dopant for Pt/TiO₂ catalysts, effect on chemisorptive behavior, 103, 320

Glycerol

electrocatalytic oxidation on Au electrodes, 104, 37 Glycolaldehyde

electrocatalytic oxidation on Au electrodes, 104, 37 intermediate in CO homogeneous hydrogenolysis over Ru carbonyl/halide catalysts, 105, 478

Glycolic acid

electrocatalytic oxidation on Au electrodes, 104, 37 Glyoxal

electrocatalytic oxidation on Au electrodes, 104, 37 Glyoxylic acid

electrocatalytic oxidation on Au electrodes, 104, 37 Gold

Ag alloy catalysts, ethylene oxidation, 108, 161
 electrodes, electrocatalytic oxidation of saturated oxygenated compounds, 104, 37

-Pt(111) and -Pt(100) alloy crystal surfaces, structure sensitivity in n-hexane conversion, 103, 208

-Ru catalyst particles, microdiffraction study, 108, 199

SiO₂-supported catalysts, methyl chloride hydrogenolysis, 103, 220

Graphite

hydrogenation over Ni catalyst, mechanism, 108, 356

metal particle-catalyzed oxidation, channeling activity, model, 106, 313

oxidation rate in air, effects of particulate oxides of group IIIB elements, 108, 480

support of MoO₃ and MoS₂, morphology changes, controlled atmosphere electron microscopy, **105**, 299

Н

Halides

iodide and bromide, preparation as metal powder catalysts for Fischer-Tropsch synthesis, 105, 359

support of Ru carbonyl catalysts, CO homogeneous hydrogenation, aldehyde intermediates, 105, 478

Heats of adsorption

CO on Pd catalysts, effects of crystallite size and support, **104**, 17

H₂ on Pd catalysts, effects of crystallite size and support, **104**, 1

O₂ adsorption on Pd crystallites, effects of crystallite size and support, 105, 342

Hectorite

pillared and delaminated catalysts, TEM, 107, 557 Heptamolybdate ions

adsorption on γ-Al₂O₃ and TiO₂, 107, 579

n-Heptane

cracking

deactivation of H-Y zeolite, 106, 235

deactivation modes of zeolites, comparisons, 106, 242

over large-pore high Si/Al zeolites, catalytic activities, 107, 288

and methylcyclohexane, reactions over Al₂O₃-supported Pt and Pt-Re catalysts, 107, 490

oxidation over Pt/Al₂O₃ catalysts, role of metallic and oxidic Pt, **104**, 375 Heterogeneous catalysis

structure sensitivity: activity and selectivity, remarks, 107, 248

n-Hexane

conversion over Au-Pt(111) and -Pt(100) alloys, surface structure sensitivity, 103, 208

hydrogenolysis over SiO₂- and TiO₂-supported Pt catalysts, comparison, **107**, 364

isomerization and hydrocracking reactions over Pt single crystals, active site analysis, 105, 233

1-Hexene

adsorption and hydrogenation on Pt/Al₂O₃ and Pt-Sn/Al₂O₃ catalysts, 103, 249

High-resolution electron microscopy

computer-simulated images of Pt clusters in Y zeolite channels, 103, 466

Pd particles photodeposited on TiO₂ and oxidized in air, 103, 436

Y- and A-type zeolites, 103, 170

Homologation

C₂H₆ over SiO₂- and SiO₂-Al₂O₃-supported reduced MoO₃ catalysts, **108**, 143

ethanol over homogeneous Co–Ru catalysts, 103, 37

ethene over

SiO₂-Al₂O₃-supported reduced MoO₃ catalysts, kinetics and catalytic studies, **106**, 354

supported MoO₃ catalysts, effects of catalyst support and pretreatment, 105, 530

HREM, see High-resolution electron microscopy Hydration

isopentenes in acetone environment over sulfonic acid resin catalyst, thermodynamics and kinetics, 103, 177

Hydrocarbons

cracking over crystalline AlPO₄-5 molecular sieve, 103, 115

formation by HCN reaction with H₂ over Fe catalysts, 106, 337

higher, synthesis from methane by oxidative conversion over

alkali-promoted Mn/SiO₂, 103, 311 transition metal oxides, 103, 302

reactions over Pt/SiO₂ catalysts, soluble Pt levels, 103, 280

skeletal isomerization over

MoO₃/Al₂O₃ catalysts, 104, 225

unsupported Mo film and powder catalysts, 104, 211

Hydrocracking

n-hexane and 2-methylpentane over Pt single crystals, active site analysis, 105, 233

Hydrodenitrogenation

aniline over Ni-W/Al₂O₃, 105, 254

Hydrodesulfurization

catalysts, compensation effect and model for catalysis, 107, 568

on CoO-MoO₃/TiO₂-ZrO₂ catalyst, evaluation, **108**, 401

gas-oil over Mo and Ni catalysts, kinetics and mechanism, 107, 255

MoS₂, promoting effect of first row transition metal sulfides, theoretical and experimental analysis, 98, 17; comment, 104, 256

thiophene over

Mo(100) crystal surface

kinetics and mechanism, 107, 92

radiotracer and catalytic study, 106, 93

role of adsorbed S and mechanism of desulfurization step, 107, 103

NiMo/Al₂O₃, poisoning by V, EPR and metal solid NMR analysis, **106**, 525

Hydrogen

adsorption on

K-promoted Rh/SiO₂ catalysts, 105, 432

γ-Mo₂N, NMR spectroscopy, 108, 50

Pt/TiO₂ surface, analysis of strong metal-support interactions, 104, 136

atmosphere, and thermal treatment of Pt supported on SiO₂ glass, dispersion changes, 105, 213 chemisorption on

cation-doped Pt/TiO₂ catalysts, role of dopant-induced metal-support interactions, 103, 320

highly dispersed Rh, Ir, and Pt catalysts, particle size determination, 105, 26

Ru/Al₂O₃ catalysts, surface area determination, effect of

adsorbed Cl, 106, 166

adsorbed Cl and crystallite size, 106, 176

Ru/SiO₂ catalysts, effects of reduction temperature and Cl, 103, 492

tungsten carbide, effects of surface composition, 103, 30

-CO

interactions with Pd/SiO₂, dispersion effects, 103, 46

olefin synthesis over C-supported Fe-Mn and K-Fe-Mn clusters, chemisorption and catalytic behavior, 103, 450

synthesis of

light olefins over Co-Th catalysts at atmospheric pressure, 105, 1

oxygenates over supported metal clusters, 106, 323

-CO₂

-Co, formation of methanol over Cu-Zn-based catalysts, reaction rates, 107, 161

interaction over Rh/Al₂O₃, CO formation, IR spectroscopy, **104**, 312

-D₂ exchange reaction

over Al₂O₃- or SiO₂-supported Pt, Re, and PtRe catalysts, **106**, 417

induction by H₂ spillover on SiO₂, 104, 288 over Pd catalysts, 107, 589

diastereoselective transfer from alcohols to ketones over liquid In, 104, 237

gaseous, isotopic exchange with Pd hydride powder, 108, 409

heating in, effect on behavior of Ni/TiO₂ catalysts, 104. 259

heats of adsorption on Pd catalysts, effects of crystallite size and support, 104, 1

heterolytic dissociation over high-temperature methanol synthesis catalysts, 108, 491

oxidation over polycrystalline Ni, rate and O₂ activity oscillations, **106**, 342

photoassisted reduction of CO₂ over metal oxides, effect of water vapor, 104, 246

reaction with

cyclopropane over supported Ru catalysts, structure sensitivity, 108, 495

HCN over Fe catalysts, hydrocarbon formation, **106**, 337

O₂ over Pt, Pd, Rh, Ir, and Ni catalysts, OH radical desorption, 107, 548

reduction of magnetite, formation of ammonia synthesis catalyst, 103, 1

spillover

effect on trimethylbenzene conversion over Al₂O₃-pillared montmorillonite, **106**, 38

reactivity with unsaturated carboxylic acids adsorbed on γ-Al₂O₃, **104**, 307

on SiO₂

induction of ethylene hydrogenation and H₂-D₂ exchange, 104, 288

from point source, scanning FTIR spectroscopy, 106, 378

transfer reactions during catalytic cracking of paraffins, 107, 451

-ZSM-5, decomposition of decanal and 1-decanol, 103, 87

Hydrogenation

benzene over

Ni catalysts, steady-state and isotopic transient kinetics, 105, 405

Pt/γ-Al₂O₃ and diluent γ-Al₂O₃ catalyst mixtures, cooperative action, **108**, 294

supported and unsupported Pd catalysts kinetics, 107, 129

reaction model, 107, 140

unsupported Ni-Re catalyst system, effect of CaO, 103, 105

benzene, ethylene, and 1-hexene on Pt/Al₂O₃ and Pt-Sn/Al₂O₃ catalysts, **103**, 249

1,3-butadiene over

Pt(110) single crystals, mechanism and C deactivation, 107, 434

S-poisoned Pt(110) single crystals, 107, 445

but-1-ene over pumice-supported monodisperse colloidal metal particle catalysts, 103, 95

CO over

Cd catalysts, isoparaffin synthesis, 103, 512

Co-Y zeolite catalysts, metal loading effects, 106, 386

Mo₂C and Mo₂N catalysts with hexagonal close packing and face-centered cubic symmetries, 108, 40 Rh catalysts, analysis using isotopic tracers, 106, 464

Rh foil, enhancement by TiO_x overlayers, **106**, 401 Ru/Al₂O₃, selectivity under transient conditions, **105**, 499

Ru/SiO₂ catalysts, effect of

C₄H₈, 108, 63

propylene, 107, 338

zeolite-supported metal catalysts, secondary reactions, effect of alkali cations, 107, 471

CO, isotopic tracer studies, analysis of transient response data, 104, 147

CO₂ over

La_{1-y} M_y CoO₃ perovskite (M = Sr,Th) catalysts, 105, 107

Rh/Nb₂O₅ or Cu/SiO₂-Rh/Nb₂O₅ catalysts at atmospheric pressure, **104**, 339

cyclohexene in liquid phase over Ni catalysts, 106, 134

ethylene

induction by H₂ spillover on SiO₂, 104, 288

over Pt surface, effect of adsorbed S, 104, 240

gas-oil sulfur compounds over Mo- and Ni-containing hydrodesulfurization catalysts, 107, 255

graphite over Ni catalyst, mechanism, 108, 356

heterogeneous, olefins, catalysis by metal clusters containing Rh-B cluster anion and rare earth cations, 106, 292

homogeneous, CO over Ru carbonyl/halide catalysts, aldehyde intermediates, 105, 478

NO in sulfuric acid over Pt/C catalysts

hydroxylamine formation, 106, 494

microstructural study, 106, 483

Hydrogen cyanide

reaction with H₂ over Fe catalysts, hydrocarbon formation, 106, 337

synthesis from CH_4 , NH_3 , and O_2 over Pt foil, 104, 441

Hydrogen exchange

effect on acidity and catalytic properties of H-Na-ZSM-8 zeolites, 105, 416

Hydrogen fluoride

-treated mordenite, acidity and activity, 103, 399

Hydrogen mordenite catalytic properties and intracrystallin

catalytic properties and intracrystalline void space structure, analysis using 1-methyl-2-ethylbenzene, 108, 433

Hydrogenolysis

n-butane over activated C-supported Pt catalysts, **107**, 1

C2H6 over

Mo₂C and Mo₂N catalysts with hexagonal close packing and face-centered cubic symmetries, 108, 40

SiO₂- and SiO₂-Al₂O₃-supported reduced MoO₃ catalysts, **108**, 143

C-O, over γ-Al₂O₃-supported monometallic and bimetallic transition metal catalysts, functional selectivity, 104, 413

- cyclohexane over Ru(0001) and Cu/Ru(0001) surfaces, kinetics, 104, 347
- cyclopentane over Al₂O₃- or SiO₂-supported Pt, Re, and PtRe catalysts, **106**, 417
- ethane over unsupported Ni-Re catalyst system, effect of CaO, 103, 105
- ethylbenzene over Ni/Al₂O₃ catalyst derived from Ni hydroaluminate, 105, 469
- n-hexane over SiO₂- and TiO₂-supported Pt catalysts, comparison, **107**, 364
- methyl chloride over metal catalysts, 103, 220 methylcyclopentane over

Pt single crystals, active site analysis, 105, 233 SiO₂- and TiO₂-supported Pt catalysts, comparison, 107, 351

Hydroxide radical

desorption during H₂-O₂ reaction over Pt, Pd, Rh, Ir, and Ni catalysts, **107**, 548

Hydroxylamine

formation by nitric oxide hydrogenation in sulfuric acid over Pt/C catalyst, 106, 494

Impregnation

profile of Ni in Al₂O₃ sphere, control, **104**, 323 ndium

liquid, diastereoselective H₂ transfer from alcohols to ketones, **104**, 237

Indole

formation from *N*-ethylaniline over poly(platinum phthalocyanine) catalyst, **107**, 240

Infrared spectroscopy

adsorbed CO formed during H₂-CO₂ interaction over Rh/Al₂O₃, **104**, 312

ethylene oxide adsorption and polymerization on MgO, 104, 299

formaldehyde oxidation over Pt/SiO₂ catalyst, evidence for CO intermediate, **105**, 258

interaction of NH₃ and O₂ at MgO-CoO solid solution surface, **103**, 270

low-temperature CO adsorption on alum-derived active Al₂O₃, **107**, 244

NO interaction with Fe-exchanged zeolites, 108, 233 simple alcohol adsorption on H-ZSM-5, 105, 455 toluene alkylation with methanol over alkali cation-exchanged zeolites, 104, 59

Intermetallics

FeTi_{1+x}, CO methanation, 107, 510

Ion exchange

aqueous, preparation of Mo-Y zeolites and characterization, 108, 283

preparation of Cu/SiO₂ catalysts and structural analysis, 108, 323

Iridium

- catalyst for H₂-O₂ reaction, OH radical desorption, comparison with Pt, Pd, Rh, and Ni catalysts, **107**, 548
- highly dispersed catalyst, particle size determination by H₂ chemisorption and EXAFS, 105, 26

- SiO₂-supported catalysts, methyl chloride hydrogenolysis, **103**, 220
- supported on chlorinated Al₂O₃ catalysts, sintering and redispersion, simulation, 103, 140

Iron

activity in steam gasification, effect of crystal structure, 104, 233

Al₂O₃-supported catalysts

in situ combined TPR and Mössbauer spectroscopy, 106, 440

simulation of supported metal catalysts in real reaction atmospheres, 107, 23

amorphous Fe91Zr9

mechanism of N₂ adsorption and ammonia synthesis kinetics, **108**, 467

surface morphological changes under ammonia synthesis conditions, 108, 452

bimetallic model catalysts supported on magnesium hydroxide carbonate, Mössbauer spectroscopy, 108. 112

-Bi-Mo oxide catalysts, ⁵⁷Fe Mössbauer spectroscopy and electron microscopy, **104**, 164

catalyst in

ammonia synthesis, role of C₇ sites and surface roughness, **103**, 213

Fischer-Tropsch synthesis, effect of carburization on catalytic activity, 107, 82

-exchanged zeolites

interaction with NO, IR and Mössbauer spectroscopy, 108, 233

Si-substituted, Mössbauer spectroscopy and catalytic activity, **104**, 381

Fe(110), reaction with ammonia, AES, 108, 484

Fe₉₁Zr₉ amorphous precursor for ammonia synthesis catalyst, bulk structural and surface chemical changes during transition to active catalyst, 107, 221

-Mn and -K-Mn catalysts, on C support chemisorption and catalytic behavior, 103, 450 olefin synthesis from CO and H₂, activity and selectivity maintenance and regenerability, 105, 155

MnO-supported catalysts for Fischer-Tropsch synthesis, physical and catalytic characterization, 105, 319

-Pt/SiO₂ catalysts, Mössbauer spectroscopy and ESR, 108, 259

-Ru/SiO₂ catalysts, Mössbauer spectroscopy and ESR, 108, 259

-Sb-Ti-O catalysts, propylene oxidation to acrolein, 107, 307

single crystal surfaces, restructuring for NH₃ synthesis, effects of Al₂O₃ and K₂O, 103, 289

 ZSM-5 catalysts, methanol deoxygenation with CO, 103, 480

Iron carbide

formation during Fischer-Tropsch synthesis, Mössbauer spectroscopy, effect of particle size and structure, 104, 365 Iron oxide

SiO₂-supported catalysts, synthesis and characterization, 106, 428

Isobutene, see Isobutylene

Isobutyl alcohol

electrocatalytic oxidation on Au electrodes, 104, 37 synthesis over promoted Cu catalysts, 104, 434 Isobutylene

and formaldehyde, vapor-phase Prins reaction, production of isoprene, 106, 280

oxidation over MoO₃ catalysts, determination of reaction active sites, 106, 188

reaction on lanthana, 105, 199

Isoelectric point

effect on Mo adsorption on fluoride-modified Al_2O_3 , 106, 210

Isomerization

n-butane over activated C-supported Pt catalysts, 107, 1

1-butene over α-Zr(HPO₄)₂·H₂O and some derived phases, 103, 346

cyclohexane over TiO₂-ZrO₂-V₂O₅ ternary oxides, role of surface acidity and basicity, **107**, 195

ethylene oxide over Ag(111) catalysts, effects of Cl and Cs promotors, 106, 54

n-hexane and 2-methylpentane over Pt single crystals, active site analysis, 105, 233

skeletal, hydrocarbons over

MoO₂/Al₂O₃ catalysts, 104, 225

unsupported Mo film and powder catalysts, 104, 211

Isoparaffin

synthesis by CO hydrogenation over Cd catalysts, 103, 512

Isoprene

production by vapor-phase Prins reaction between formaldehyde and isobutene, 106, 280

Isopropanol

dehydration over α-Zr(HPO₄)₂·H₂O and some derived phases, 103, 346

Isopropyl alcohol

adsorption on H-ZSM-5, IR spectroscopy, 105, 455 Isotope exchange

between gaseous H₂ and Pd hydride powder, analysis, 108, 409

measurements of CO and CO₂ interconversion and adsorption/desorption rates over chromia-promoted magnetite, implications for water-gas shift, 103, 65

regioselective, between propane and deuterium over illuminated Pt/TiO₂ catalyst below room temperature, 108, 426

Κ

Ketones

diastereoselective H₂ transfer from alcohols over liquid In, 104, 237

L

Lanthana, see Lanthanum

Lanthanides

support of dispersed Pd, methanol and methane formation, 108, 97

Lanthanum

catalysts for reactions of alkanes with deuterium at high temperature, 107, 424

 Co intermetallic catalysts, electron microscopy, 105, 120

 $La_{1-y}M_yCoO_3$ perovskites (M = Sr,Th)

bulk and surface reduction studies, 105, 95

CO₂ hydrogenation activity, 105, 107 reactions with alkenes, 105, 199

Lanthanum aluminum oxides

amorphous, support of methane oxidative coupling, 106, 394

Lanthanum rhodate

synthesis, characterization, and catalytic activity, 103, 407

М

Magnesia, see Magnesium oxide

Magnesium

dopant for Pt/TiO₂ catalysts, effect on chemisorptive behavior, 103, 320

Mg(0001) surface, propylene reactions, role of surface oxygen, 106, 538

-V-O catalysts, butane oxidative dehydrogenation, 105, 483

Magnesium hydroxide carbonate

support of bimetallic model catalysts, Mössbauer spectroscopy, 168, 112

Magnesium oxide

-CoO solid solutions, surface interaction with NH₃ and O₂, IR spectroscopy, 103, 270

ethylene oxide adsorption and polymerization, IR spectroscopy, 104, 299

reaction with CO, synthesis of surface formate, 105, 366

support of

MoO₃ catalysts: calcination of mechanical mixtures, 105, 445

Ni catalysts, deactivation during CO methanation and disproportionation, 107, 275

Magnetic field

effect on heterogeneous catalytic reactions, 107, 566 Magnetite, see Ferrosoferric oxide

Maleic acid

adsorption on γ-Al₂O₃, reactivity with spillover hydrogen, **104**, 307

Maleic anhydride

synthesis over V-P-O catalysts, catalyst stability, 104, 99

Manganese

 -Fe and -Fe-K catalysts, on C support chemisorption and catalytic behavior, 103, 450 olefin synthesis from CO and H₂, activity and selectivity maintenance and regenerability, 105, 155

SiO₂-supported catalysts, alkali-promoted, oxidative conversion of methane to higher hydrocarbons, 103, 311

Manganese oxide

-based oxide supports for CoO combustion catalysts, effect of additives on support surface area, 103, 385

-modified Ni(111) surfaces, CO chemisorption, 106, 369

support of Fe catalysts for Fischer-Tropsch synthesis, physical and catalytic characterization, 105, 319

Mass spectrometry

pulsed field desorption, RuO_x mobility on Pt surface, 108, 268

Mass spectroscopy

static secondary ion, Al₂O₃- and SiO₂-supported Mo catalysts, 105, 175

Metal loading

effect on CO hydrogenation activity of Co-Y zeolite, **106**, 386

Metal oxides

support of H₂, photoassisted reduction of CO₂, effect of water vapor, **104**, 246

Metals

powder catalysts for Fischer-Tropsch synthesis, preparation by K reduction of halides in THF, 105, 359

-support interactions

oxygen vacancy model, 104, 120

in Pt/TiO₂ catalysts, microcalorimetric study, **104**, 136

sulfur-aided, in Pt/Al_2O_3 -Cl catalysts, 106, 73 Methanation

activity of Pd/TiO₂ catalysts in strong metal-support interaction state, letter to editor, 108, 501

on clean and ${\rm TiO_2}$ -covered Pt foil, kinetics, 105, 373 CO

associated deactivation of Ni-based catalysts, 107, 275

over FeTi_{1+x} intermetallics, 107, 510

CO₂ over Co catalysts, activating effect of catalyst pre-oxidation, 106, 144

over high activity exfoliated MoS₂ catalysts, 103, 334

Methane

catalytic partial oxidation, in formaldehyde synthesis, 108, 252

formation over Pd dispersed on lanthanide rare earth oxides, 108, 97

oxidation over

alkali-promoted Mn/SiO₂, **103**, 311 amorphous lanthanum Al oxides, **106**, 394 SiO₂-supported heteropolyacids, **106**, 512 transition metal oxides, **103**, 302

reaction with deuterium over lanthana catalysts at high temperature, 107, 424

Methanol

adsorption on H-ZSM-5, IR spectroscopy, 105, 455 alkylation with toluene over

alkali cation-exchanged zeolites, in situ IR spectroscopy, 104, 59

X zeolites in different alkali cation forms, 107, 296 conversion over H-ZSM-5

and H-Y zeolites, primary reaction steps, 108, 208 yield studies and ³H NMR analysis of routes to ethylene production, 108, 153

deoxygenation with CO over Fe-ZSM-5 catalysts, 103, 480

formation

from CO, CO₂, and H₂ over Cu-Zn-based catalysts, reaction rates, 107, 161

from formaldehyde over Cu/ZnO catalysts, 105, 352

over Pd(110), catalyst activity, 108, 364

over Pd dispersed on lanthanide rare earth oxides, 108, 97

over promoted Cu catalysts, 104, 434

in HCN synthesis over Pt foil, 104, 441

high-temperature synthesis catalysts, heterolytic dissociation of H₂, 108, 491

H-ZSM-5-catalyzed ethylene formation, letter to editor, 103, 524; response, 103, 526

intermediate in CO homogeneous hydrogenolysis over Ru carbonyl/halide catalysts, 105, 478

oxidation over Pd-Ag/Al₂O₃ catalysts, synergistic interactions between metal components, 103, 419

partial oxidation to formaldehyde over Mo/SiO₂, 103, 55

reaction with ammonia on Na-mordenite, synthesis and equilibration of methylamines, 103, 20

synthesis catalysts derived from rare earth-copper alloys, activation and performance, 106, 216

Methylamine

synthesis and equilibration on Na-mordenite, 103, 20

2-Methyl-2-butanol, see tert-Pentyl alcohol

2-Methyl-1-butene

synthesis over sulfonic acid resin catalyst in acetone environment, thermodynamics and kinetics, 103, 177

2-Methyl-2-butene, see Amylene

Methyl chloride

hydrogenolysis over metal catalysts, 103, 220 Methylcyclohexane

and n-heptane, reactions over Al₂O₃-supported Pt and Pt-Re catalysts, 107, 490

Methylcyclopentane

hydrogenolysis over

Pt single crystals, active site analysis, 105, 233 SiO₂- and TiO₂-supported Pt catalysts, comparison, 107, 351

Methylene glycol

homogeneous catalytic condensation, effects of oxygen and reducing sugars, 103, 239

volume changes during homogeneous catalytic condensation, 103, 474

1-Methyl-2-ethylbenzene

reaction patterns over molecular sieves and other catalysts, 108, 433

Methyl formate

formation from formaldehyde over Cu/ZnO catalysts, 105, 352

2-Methylpentane

isomerization and hydrocracking reactions over Pt single crystals, active site analysis, 105, 233

3-Methylpentane

aromatization over Ni catalysts, mechanism, 105, 65

2-Methylpropane

reaction with deuterium over lanthana catalysts at high temperature, 107, 424

2-Methyl-1-propanol, see Isobutyl alcohol

2-Methyl-2-propanol, see tert-Butyl alcohol

2-Methylpropene, see Isobutylene

Methyl vinyl ketone

oxyhydrative scission over V₂O₅-MoO₃ catalyst, 104. 359

production by vapor-phase aldol condensation between formaldehyde and acetone, 106, 273

Models

Al₂O₃-supported Co, Fe, or Ni catalysts, simulation of supported metal catalysts in real reaction atmospheres, 107, 23

benzene hydrogenation over supported and unsupported Pd catalysts, 107, 140

channeling activity of metal particles during catalyzed oxidation of graphite, 106, 313

ensemble control by alloying and poisoning catalysts

comparison with Monte Carlo simulations and experimental results, 104, 466

mathematical assumptions and derivations, 104, 454

hydrodesulfurization catalysts, 107, 568

oxygen vacancy, in strong metal-support interactions, 104, 120

pseudo-liquid catalysis, reaction mechanism of ethanol dehydration on/in heteropoly compounds, 106, 329

two-site and distributed-site, for Fischer-Tropsch synthesis, differentiating criteria, 105, 266

Molecular sieves

crystalline AlPO₄-5, site energy distribution and catalytic properties, 103, 115

gallosilicate, role of framework and nonframework Ga on catalytic cracking activity, **106**, 287

hexacyanometallate salts, 105, 163

Molybdates

adsorption on γ-Al₂O₃, Mo-95 NMR, **107**, 154 Molybdena, see Molybdenum trioxide

Molybdenum

additive in γ-Al₂O₃-based catalysts, sulfidation effects, **106**, 544

adsorption on fluoride-modified Al₂O₃, effect of isoelectric point, 106, 210

Al₂O₃-supported catalysts

CO₂ adsorption, determination of MoS₂ surface coverage, **106**, 65

hydrodesulfurization catalysts, structure, support effects, 105, 277

NiCo-promoted, surface exposure, effect of calcination temperature, 103, 228

 Bi-Fe oxide catalysts, ⁵⁷Fe Mössbauer spectroscopy and electron microscopy, 104, 164

clean and carbided single-crystal surface for thiophene hydrodesulfurization, radiotracer and catalytic study, 106, 93

-Co sulfided hydrodesulfurization catalysts, effect of NO adsorption, EPR, 107, 587

C-supported hydrodesulfurization catalysts, structure, support effects, 105, 277

migration into intracrystalline cavities in Mo-impregnated Na-Y zeolite, 108, 334

Mo(100) single crystal surface, thiophene hydrodesulfurization

kinetics and mechanism, 107, 92

role of adsorbed S and mechanism of desulfurization step, 107, 103

 -Ni/Al₂O₃ catalysts for thiophene hydrodesulfurization, poisoning by V, EPR and metal solid NMR analysis, 106, 525

-Pr-O catalysts, propene partial oxidation, 107, 325 -Ru/Al₂O₃ catalysts, synthesis and XPS, 107, 482

SiO₂- and Al₂O₃-supported catalysts, static secondary ion mass spectroscopy, 105, 175

SiO₂-supported catalysts

partial oxidation of methanol to formaldehyde, 103, 55

photoreduction with CO, 107, 8

TiO₂-supported catalysts, Raman spectroscopy, 106, 85

-transition metal/γ-Al₂O₃ catalysts, functional selectivity for C-O hydrogenolysis, **104**, 413

unsupported film and powder catalysts, skeletal isomerization of hydrocarbons, 104, 211

Molybdenum carbide

hexagonal close packing and face-centered cubic symmetries

CO hydrogenation and C₂H₆ hydrogenolysis activities, 108, 40

preparation and characterization, 108, 24

oxygen diffusion, TPD and TPR, 107, 393

unsupported powder catalysts, synthesis, 106, 125 Molybdenum disulfide

catalyst for thiophene deuterodesulfurization, reaction mechanism, 103, 261

exfoliated, high activity catalysts for methanation, 103, 334

hydrodesulfurization activity, promoting effect of first row transition metal sulfides, theoretical and experimental analysis, 98, 17; comment, 104, 256

surface coverage, determination by CO₂ adsorption over Mo/Al₂O₃ catalysts, **106**, 65

Molybdenum nitride

face-centered cubic symmetry

CO hydrogenation and C₂H₆ hydrogenolysis activities, **108**, 40

preparation and characterization, 108, 24

γ-Molybdenum nitride

H₂ adsorption, NMR spectroscopy, **108**, 50 Molybdenum oxide

catalysts for ethene homologation, effects of catalyst support and pretreatment, 105, 530

interactions with various oxide supports, calcination of mechanical mixtures, 105, 445

SiO₂- and SiO₂-Al₂O₃-supported reduced catalysts, homologation, hydrogenolysis, and dehydrogenation of C₂H₆, **108**, 143

supported on Al₂O₃ and graphite thin films, morphology changes, controlled atmosphere electron microscopy, **105**, 299

thin-film Al₂O₃-supported catalysts, structural analysis, **103**, 366

Molybdenum sulfide

reduced, catalyst for thiophene deuterodesulfurization, reaction mechanism, 103, 261

supported on Al₂O₃ and graphite thin films, morphology changes, controlled atmosphere electron microscopy, **105**, 299

thin-film Al₂O₃-supported catalysts, structural analysis, 103, 366

Molybdenum trioxide

Al₂O₃-supported catalysts

deuterium reaction with benzene and alkylbenzenes, 108, 185

in oxide and reduced forms, XPS, 104, 202 skeletal isomerization of hydrocarbons, 104, 225 vapor pressure measurements, 108, 175

catalyst for NO_x reduction with NH₃, effect of grain morphology, 103, 394

catalyst surface, determination of active sites for oxidation of olefin molecules, 106, 188

 -CoO hydrodesulfurization catalyst supported over TiO₂--ZrO₂, evaluation, 108, 401

crystal surfaces

evidence for short-range order and steps, 103, 200 in oxidation of propene, 104, 71

reduced, SiO₂-Al₂O₃-supported catalysts for ethene homologation, kinetics and catalytic studies, **106**, 354

12-Molybdophosphate

catalysts for acrolein oxidation catalytic testing, 106, 16 characterization, 106, 1 reaction mechanism, 106, 23 SiO₂-supported catalysts, methane oxidation, 106, 512

12-Molybdosilicic acid

SiO₂-supported catalysts, methane oxidation, 106, 512

10-Molybdo-2-vanadophosphoric acid

 SiO_2 -supported catalysts, methane oxidation, 106, 512

Montmorillonite

pillared with Al₂O₃, catalytic activity for trimethylbenzene conversion, effect of spillover hydrogen, **106**, 38

Morphology

grain, MoO₃ catalysts, effect on reduction of NO_x with NH₃, 103, 394

high-surface-area solids, 106, 202

MoO₃ and MoS₂ supported on Al₂O₃ and graphite, controlled atmosphere electron microscopy, 105, 299

Mössbauer spectroscopy

bimetallic model catalysts supported on Mg hydroxide carbonate, 108, 112

⁵⁷Fe, Bi-Fe-Mo oxide catalysts, 104, 164

Fe carbides formed during Fischer-Tropsch synthesis, effect of particle size and structure, 104, 365 NO interaction with Fe-exchanged zeolites, 108, 233 SiO₂-supported FeRu and FePt catalysts, 108, 259 Si-substituted Fe-exchanged Y zeolite, 104, 381 and TPR, combined in situ analyses of Fe/Al₂O₃ catalysts, 106, 440

N

Neodymium

-Cu alloy precursors for methanol synthesis catalysts, activation and performance, 106, 216

Neopentane

reaction with deuterium over lanthana catalysts at high temperature, 107, 424

Nickel

Al₂O₃-supported model catalysts, simulation of supported metal catalysts in real reaction atmospheres, **107**, 23

γ-Al₂O₃-supported catalysts

formation of SO₂ and SO₄ radicals, ESR, 103, 506 interaction during deposition from aqueous solution, 104, 86

AlPO₄-supported catalysts, effect on gas-phase dehydrogenation of alkylbenzenes, 107, 181

 B amorphous films, O₂-treated, surface characterization, 108, 256

-based catalysts

benzene hydrogenation, steady-state and isotopic transient kinetics, 105, 405

cyclohexene liquid phase hydrogenation, **106**, 134 deactivation during CO methanation and disproportionation, **107**, 275

graphite hydrogenation, mechanism, 108, 356 H₂-O₂ reaction, OH radical desorption, comparison with Pt, Pd, Rh, and Ir catalysts, 107, 548 3-methylpentane aromatization, mechanism, 105, 65

use of acidic TiO₂/SiO₂ mixed oxides as supports, **105**, 511

-Co promoters for Mo/Al₂O₃ catalysts, surface exposure, effect of calcination temperature, 103, 228

-Fe model catalysts supported on Mg hydroxide carbonate, Mössbauer spectroscopy, 108, 112

-Mo/Al₂O₃ catalysts for thiophene hydrodesulfurization, poisoning by V, EPR and metal solid NMR analysis, 106, 525

Ni(111) surfaces, MnO_x-modified, CO chemisorption, **106**, 369

particles in Al₂O₃ sphere, control of impregnation profile, **104**, 323

polycrystalline, H₂ oxidation, rate and O₂ activity oscillations, **106**, 342

-Re catalysts, unsupported, modified by CaO, characterization and catalytic activity, 103, 105

SiO₂-supported catalysts

cyclopentane exchange with D₂, NMR spectroscopy, **104**, 480

TPD analysis of deuterated formic acid, 104, 424 TiO₂-supported catalysts, effects of heating in H₂ and O₂ atmospheres, 104, 259

 -W/Al₂O₃ catalysts, aniline hydrodenitrogenation, 105, 254

-ZSM-5 catalysts, decomposition of decanal and 1-decanol, 103, 87

Nickel hydroaluminate

derived Ni/Al₂O₃ catalyst, ethylbenzene hydrogenolysis, **105**, 469

Nickel oxide

γ-Al₂O₃-supported catalysts, in situ laser Raman spectroscopy, 103, 224

Nickel tetraphenylporphin

interaction with aluminosilicate cracking catalysts, 108, 214

Niobia, see Niobium pentoxide

Niobium pentoxide

-SiO₂ surface oxides in thin films, morphology and structure, **108**, 383

support of Rh catalysts, CO₂ hydrogenation at atmospheric pressure, **104**, 339

Nitric oxide

hydrogenation

to hydroxylamine in sulfuric acid over Pt/C catalyst, 106, 494

in sulfuric acid over Pt/C catalysts, microstructural study, 106, 483

interaction with Fe-exchanged zeolites, IR and Mössbauer spectroscopy, 108, 233

reaction over Pt/C catalysts, N₂ desorption, **105**, 263 reduction with NH₃ over MoO₃ catalysts, effect of catalyst grain morphology, **103**, 394

Nitrogen

adsorption

on amorphous Fe₉₁Zr₉ surface, mechanism, 108, 467

method for measuring acid-base sites on Al_2O_3 , 105, 536

desorption, in reaction of NO over Pt/C catalysts, 105, 263

Nitrous oxide

adsorption on sulfided Co-Mo hydrodesulfurization catalysts, EPR, 107, 587

decomposition

and ethylene oxidation over Ag(111) surface, 104, 156

over Si-substituted Fe-exchanged Y zeolite, 104,

NMR, see Nuclear magnetic resonance

Nuclear magnetic resonance

⁶³Cu, dispersion of Cu/SiO₂ catalysts, **107**, 583 cyclopentane exchange with D₂ over metal cata-

cyclopentane exchange with D_2 over metal catalysts, **104**, 480

H₂ adsorption on γ-Mo₂N, 108, 50

³H, ethylene production during methanol conversion over H-ZSM-5, **108**, 153

high-resolution solid-state, ethylene chemisorption on Al₂O₃- or SiO₂-supported Pt catalysts, **108**, 15

metal solid, hydrodesulfurization poisoning by V compounds, 106, 525

Mo-95, molybdate adsorption on γ-Al₂O₃, 107, 154 probe for *in situ* studies of adsorbed species on catalysts, 106, 111

0

Octane

cracking over H-Y zeolite, hydrogen transfer reactions, 107, 451

n-Octene

reaction over H-Y zeolites, kinetics, 108, 346 Oil

-gas cracking over Y zeolites, effects of dealumination by various methods, 108, 135

Olefins

C₂-C₄, synthesis from CO and H₂ over C-supported Fe-Mn and K-Fe-Mn catalysts, activity and selectivity maintenance and regenerability, **105**, 155

formation over H-ZSM-5 and H-Y zeolites, primary reaction steps, 108, 208

heterogeneous hydrogenation, catalysis by metal clusters containing Rh-B cluster anion and rare earth cations, 106, 292

light, synthesis from CO-H₂ mixtures over Co-Th catalysts at atmospheric pressure, 105, 1

synthesis from CO and H_2 over C-supported Fe-Mn and K-Fe-Mn clusters, chemisorption and catalytic behavior, 103, 450

```
pore length effects on product selectivity, 105,
α-Olefins
  polymerization over modified chromium(III) ace-
       tate, 105, 249
                                                                    products and reaction routes, 105, 10
                                                                  methane, in formaldehyde synthesis, 108, 252
Osmium
  SiO<sub>2</sub>-supported catalysts, methyl chloride hydro-
                                                                  methanol to formaldehyde over Mo/SiO<sub>2</sub>, 103, 55
                                                                Pd particles photodeposited on TiO2, HREM, 103,
       genolysis, 103, 220
                                                                    436
Overlayers
  formation in Pt-WO<sub>3</sub>/SiO<sub>2</sub> model catalysts, TEM,
                                                               propene over
       108, 304
                                                                  MoO<sub>3</sub>, role of catalyst crystal face, 104, 71
                                                                  Mo-Pr-O catalysts, 107, 325
Oxalic acid
  electrocatalytic oxidation on Au electrodes, 104, 37
                                                                propylene to acrolein over Fe-Sb-Ti-O catalysts,
Oxidation
                                                                    107, 307
  acrolein over 12-molybdophosphate catalysts
                                                               reactions, photocatalytic activities of metal oxide
    characterization, 106, 1
                                                                    semiconductors, 106, 295
    reaction mechanism, 106, 23
                                                                -reduction treatment
    testing, 106, 16
                                                                  Rh/nonporous silica spheres, 108, 444
  activation of Co catalyst in CO<sub>2</sub> methanation, 106,
                                                                  Rh/SiO<sub>2</sub> catalysts, effect on morphology, 107, 535
                                                                selective, 1-butene and CO over MSbO<sub>4</sub> catalysts
       144
  CO over
                                                                    (M = \text{Fe,Al,Cr,Co,Rh}), 104, 47
    Cu-mordenite
                                                               SO<sub>2</sub> over
       diffusion limitations, 103, 204
                                                                  K/V and Cs/V catalysts
       reaction kinetics and mechanism, 104, 176
                                                                    kinetics, comparison, 103, 126
    PrO_x, role of lattice oxygen atoms, 105, 525
                                                                    at low temperatures, rate limiting factors, 104,
     Pt/TiO<sub>2</sub> catalysts, effects of TiO<sub>2</sub> crystal phases,
                                                                       186
       FTIR spectroscopy, 105, 386
                                                                  V_2O_5-M_2S_2O_7 (M = K,Na) melts, effect of SiO<sub>2</sub>,
  3,5-di-tert-butylcatechol over homogeneous Cu(II)
                                                                    103, 160
       chelates and Cu(II)-poly(vinylpyridine) com-
                                                               Tb oxides, effects of additives, 103, 216
       plexes, 108, 369
                                                               toluene over V-TiO2 catalysts in flow reactor, FTIR
  electrocatalytic, saturated oxygenated compounds
                                                                    spectroscopy, 106, 471
       on Au electrodes, 104, 37
                                                             Oxidative coupling
  ethene over oxygen-preconditioned Ag foil, kinet-
                                                               methane over amorphous lanthanum aluminum ox-
       ics, 105, 39
                                                                    ides, 106, 394
  ethylene
                                                             Oxides
    over Ag-Au alloy catalysts, 108, 161
                                                               La_1 \cdot M_v CoO_3 perovskite (M = Sr, Th)
    by N<sub>2</sub>O over Ag(111) surface and Ag/α-Al<sub>2</sub>O<sub>3</sub> cata-
                                                                  bulk and surface reduction studies, 105, 95
       lysts, 104, 156
                                                                  CO<sub>2</sub> hydrogenation activity, 105, 107
  formaldehyde over Pt/SiO<sub>2</sub> catalysts, evidence for
                                                               metal, semiconductors, photocatalytic activities for
       CO intermediate, 105, 258
                                                                    <sup>18</sup>O<sub>2</sub> isotope exchange and oxidation reactions,
  graphite
                                                                    106, 295
    metal particle-catalyzed, channeling activity,
                                                               particulate, group IIIB elements, effects on oxida-
       model, 106, 313
                                                                    tion rate of graphite in air, 108, 480
    rate in air, effects of particulate oxides of group
                                                               surface, Nb<sub>2</sub>O<sub>5</sub>-SiO<sub>2</sub> in thin films, morphology and
       IIIB elements, 108, 480
                                                                    structure, 108, 383
  n-heptane over Pt/Al<sub>2</sub>O<sub>3</sub> catalysts, role of metallic
                                                               transition metals
       and oxidic Pt, 104, 375
                                                                  as catalysts for oxidative conversion of methane
  methane over
                                                                    to higher hydrocarbons, 103, 302
    alkali-promoted Mn/SiO2, 103, 311
                                                                  supported on Al<sub>2</sub>O<sub>3</sub>, as acid cracking catalysts,
    SiO<sub>2</sub>-supported heteropolyacids, 106, 512
                                                                    periodic trends and relationship to activity and
    transition metal oxides, 103, 302
                                                                    selectivity, 107, 463
  methanol and CO over Pd-Ag/Al<sub>2</sub>O<sub>3</sub> catalysts, syn-
                                                             Oxide supports
      ergistic interactions between metal compo-
                                                               -metal interactions, strong
       nents, 103, 419
                                                                  oxygen vacancy model, 104, 120
                                                                  in Pt/TiO2 catalysts, microcalorimetric study, 104,
    and ketones over V2O5-MoO3 catalyst, 104, 359
                                                                    136
    over MoO<sub>3</sub> catalyst surfaces, determination of re-
                                                             Oxygen
      action active sites, 106, 188
                                                               activity oscillations during H<sub>2</sub> oxidation over poly-
                                                                    crystalline Ni, 106, 342
```

atmosphere, and thermal treatment of Pt supported

on SiO₂ glass, dispersion changes, 105, 213

1,3-butadiene over V2Oy/Al2Oy/Al-coated cata-

lysts

chemisorption on

cation-doped Pt/TiO₂ catalysts, role of dopant-induced metal-support interactions, 103, 320

Ru/SiO₂ catalysts, effects of reduction temperature and Cl, 103, 492

V₂O₅, kinetics, 107, 503

-C hydrogenolysis over γ-Al₂O₃-supported monometallic and bimetallic transition metal catalysts, functional selectivity, 104, 413

diffusion in Mo₂C, TPD and TPR, 107, 393

effect on homogeneous catalytic condensation of methylene glycol, 103, 239

-ethylene mixtures, interaction with supported Ag catalysts, surface-enhanced Raman study, 103, 188

exchange of C in CO/CO₂ mixtures over alkali catalysts, extended model, **107**, 173

 -Fe-Sb-Ti catalysts, propylene oxidation to acrolein, 107, 307

in HCN synthesis over Pt foil, 104, 441

heating in, effect on behavior of Ni/TiO₂ catalysts, 104, 259

heats of adsorption measurements on Pd crystallites, effects of crystallite size and support, 105, 342

interaction with MgO-CoO solid solution surface, IR spectroscopy, 103, 270

lattice atoms, role in catalytic oxidation of CO by PrO_x, 105, 525

-Mo-Pr catalysts, propene partial oxidation, 107, 325

radioisotope exchange, photocatalytic activities of metal oxide semiconductors, 106, 295

reaction with H₂ over Pt, Pd, Rh, Ir, and Ni catalysts, OH radical desorption, 107, 548

surface, role in propylene reactions at Mg(0001) surface, 106, 538

-treated amorphous Ni-B films, surface characterization, 108, 256

vacancy model for strong metal-support interactions, 104, 120

-V-Mg catalysts, butane oxidative dehydrogenation, 105, 483

-V-P catalysts, stability during maleic anhydride synthesis, **104**, 99

Oxygenates

ethanol-induced formation during Fischer-Tropsch synthesis, **105**, 335

synthesis from CO and H₂ over supported metal clusters, 106, 323

Р

Palladium

-Ag/Al₂O₃ catalysts, synergism in methanol and CO oxidation, 103, 419

catalyst for H_2 - O_2 reaction, OH radical desorption, comparison with Pt, Rh, Ir, and Ni catalysts, 107, 548

crystallites, O₂ heats of adsorption measurements, effects of crystallite size and support, 105, 342

dispersed on lanthanide rare earth oxides, methanol and methane formation, 108, 97

H₂-D₂ exchange reaction, 107, 589

heats of adsorption

CO, effects of crystallite size and support, 104, 17 H₂, effects of crystallite size and support, 104, 1 particles photodeposited on TiO₂ and oxidized in air, HREM, 103, 436

Pd(110), activity for methanol synthesis, 108, 364 pumice-supported catalysts, behavior in but-1-ene hydrogenation, 103, 95

SiO₂-AlPO₄-supported catalysts, cyclohexene, gasphase disproportionation, optimization, 108, 487

SiO₂-supported catalysts

interactions with H_2 and CO, dispersion effects, 103, 46

methyl chloride hydrogenolysis, 103, 220

supported and unsupported catalysts for benzene hydrogenation

kinetics, 107, 129

reaction model, 107, 140

TiO₂-supported catalysts, in strong metal-support interaction state, methanation activity, letter to editor, 108, 501

Palladium hydride

powder, isotopic exchange with gaseous hydrogen, 108, 409

n-Paraffins

cracking over H-Y zeolites, reaction kinetics, 104, 80

Particles

Au-Ru catalysts, microdiffraction study, 108, 199
Fe carbides formed during Fischer-Tropsch synthesis, structure, Mössbauer spectroscopy, 104, 365

Particle size

Fe carbides formed during Fischer-Tropsch synthesis, Mössbauer spectroscopy, 104, 365

highly dispersed Rh, Ir, and Pt catalysts, H₂ chemisorption and EXAFS, 105, 26

tert-Pentyl alcohol

synthesis over sulfonic acid resin catalyst in acetone environment, thermodynamics and kinetics, 103, 177

Perylene

radicals adsorbed on Al₂O₃ and SiO₂-Al₂O₃ powders, electron-nuclear double-resonance spectroscopy, **106**, 500

Phentydrone

refluxing, for K reduction of halides in preparation of metal powder catalysts for Fischer-Tropsch synthesis, 105, 359

Phosphorus

 V-O catalysts, stability during maleic anhydride synthesis, 104, 99 Phosphorus pentoxide

 $-V_2O_5$ catalysts for vapor-phase aldol condensation of formaldehyde with acetic acid, 107, 201

Photocatalysis

activity of metal oxide semiconductors for ¹⁸O₂ isotope exchange and oxidation reactions, **106**, 295

regioselective isotope exchange between propane and deuterium over illuminated Pt/TiO₂ below room temperature, **108**, 426

Photodeposition

Pd particles on TiO₂, HREM, 103, 436

Photoreduction

CO₂ by H₂ over metal oxides, effect of water vapor, **104**, 246

Mo/SiO₂ catalysts with CO, 107, 8 Platinum

Al₂O₃-supported catalysts

adsorption and hydrogenation of benzene, ethylene, and 1-hexene, 103, 249

CO adsorption, 103, 249

cyclohexane dehydrogenation, effect of S poisoning, 105, 144

n-heptane oxidation, role of metallic and oxidic Pt, **104**, 375

and Pt-Re/Al₂O₃ catalysts, methylcyclohexane and n-heptane reactions, 107, 490

redispersion by film formation, 108, 77

and SiO₂-supported catalysts, ethylene chemisorption, high-resolution solid-state NMR, 108, 15

sulfur-aided metal-support interactions, 106, 73 γ-Al₂O₃-supported catalysts, and γ-Al₂O₃ diluent, cooperative action in benzene hydrogenation, 108, 294

 Au alloy crystal surfaces, structure sensitivity in nhexane conversion, 103, 208

catalyst for H₂-O₂ reaction, OH radical desorption, comparison with Pd, Rh, Ir, and Ni catalysts, **107**, 548

charcoal-supported catalysts for hydrogenation of NO in sulfuric acid, microstructural study, **106**, 483

clusters in Y zeolite channels, computer-simulated HREM images, 103, 466

C-supported catalysts

for hydroxylamine formation by nitric oxide hydrogenation in sulfuric acid, 106, 494

isomerization and hydrogenolysis of *n*-butane, 107, 1

reaction with NO, N₂ desorption, 105, 263

diffusion and adsorption of TiO₂, role of strong metal-support interactions, **103**, 426

-Fe/SiO₂ catalysts, Mössbauer spectroscopy and ESR, 108, 259

foil

clean and TiO₂-covered, methanation kinetics, **105**, 373

synthesis of HCN from CH₄, NH₃, and O₂, 104, 441

highly dispersed catalyst, particle size determination by H₂ chemisorption and EXAFS, **105**, 26 mobility of RuO_x species on, pulsed field desorption mass spectrometry, **108**, 268

and PtRe, Al₂O₃- or SiO₂-supported catalysts, isotope exchange and hydrogenolysis of cyclopentane, **106**, 417

Pt(110) single crystals

1,3-butadiene hydrogenation, mechanism and C deactivation, 107, 434

S-poisoned, 1,3-butadiene hydrogenation, 107, 445

pumice-supported catalysts, behavior in but-1-ene hydrogenation, 103, 95

single crystals, surface structure, correlations with hydrocarbon skeletal rearrangement mechanisms, 105, 233

SiO₂-supported catalysts

dispersion changes during thermal treatment in H_2 and O_2 atmospheres, 105, 213

formaldehyde oxidation, evidence for CO intermediate, 105, 258

methyl chloride hydrogenolysis, 103, 220

for skeletal reactions of hydrocarbons, soluble Pt levels, 103, 280

and TiO₂-supported catalysts for methylcyclopentane hydrogenolysis, comparison, 107, 351

-Sn/Al₂O₃ catalysts

adsorption of CO, 103, 249

adsorption and hydrogenation of benzene, ethylene, and 1-hexene, 103, 249

alloy formation, in situ X-ray diffraction, 106, 449

soluble, levels in Pt/SiO₂-catalyzed skeletal reactions of hydrocarbons, 103, 280

surface adsorption of S, effect on catalysis of ethylene hydrogenation reaction, 104, 240

TiO₂-supported catalysts

cation-doped, chemisorptive behavior, role of dopant-induced metal-support interactions, 103, 320

CO oxidation, effects of TiO₂ crystal phases, FTIR spectroscopy, **105**, 386

illuminated, regioselective isotope exchange between propane and deuterium below room temperature, 108, 426

strong metal-support interactions, microcalorimetric study, 104, 136

–WO₃/SiO₂ catalysts

characterization, 107, 114

overlayer formation, TEM, 108, 304

Poisoning

acid sites on H-Na-ZSM-8 zeolites, effect on acidity and catalytic properties, 105, 416

and alloying catalysts, for ensemble control, statistical model

assumptions and derivations, 104, 454

comparison with Monte Carlo simulations and experimental results, 104, 466 thiophene hydrodesulfurization over NiMo/Al₂O₃ catalysts, EPR and metal solid NMR, **106**, 525 Polymerization

alkene-oxide over hexacyanometallate salts, 105,

ethylene oxide on MgO, IR spectroscopy, 104, 299 α -olefins over modified chromium(III) acetate, 105, 249

Poly(platinum phthalocyanine)

catalysis of indole formation from N-ethylaniline, 107, 240

Poly(vinylpyridine)

-Cu(II) complexes, as catalysts for 3,5-di-tert-butylcatechol oxidation, 108, 369

Pores

V₂O₃/Al₂O₃/Al-coated catalyst surfaces, effects of lengths on product selectivity from partial oxidation of 1,3-butadiene, 105, 19

Pore size

distribution in delaminated clay cracking catalyst, 104, 331

Potassium

dopant for Pt/TiO₂ catalysts, effect on chemisorptive behavior, 103, 320

-Fe-Mn clusters on C support, chemisorption and catalytic behavior, 103, 450

-Mn-Fe catalysts, C-supported, olefin synthesis from CO and H₂, activity and selectivity maintenance and regenerability, 105, 155

-promoted Rh/SiO₂ catalysts, adsorption and reaction of CO and H₂, 105, 432

reduction of halides in THF, preparation of metal powder catalysts for Fischer-Tropsch synthesis, 105, 359

V-supported catalysts, SO₂ oxidation

kinetics, comparison with Cs/V catalysts, 103, 126 at low temperatures, rate limiting factors, 104, 186

Potassium oxide

effect on restructuring Fe single crystal surfaces for NH₃ synthesis, **103**, 289

Praseodymium

-Mo-O catalysts, propene partial oxidation, 107, 325

Praseodymium oxide

catalytic oxidation of CO, role of lattice oxygen atoms, 105, 525

Precious metals

low-concentration supported catalysts, preparation by thermal transport, 106, 307

Prins reaction

vapor-phase, between formaldehyde and isobutene, production of isoprene, 106, 280

Propane

reaction with deuterium over lanthana catalysts at high temperature, 107, 424

regioselective isotopic exchange with deuterium over illuminated Pt/TiO₂ catalyst below room temperature, 108, 426

n-Propanol

synthesis over promoted Cu catalysts, 104, 434

1-Propanol, see n-Propyl alcohol

2-Propanol, see Isopropyl alcohol

Propene, see Propylene

n-Propyl alcohol

adsorption on H-ZSM-5, IR spectroscopy, 105, 455 Propylene

conversion to higher hydrocarbons over ZSM-5 catalysts, 105, 270

effect on CO hydrogenation over Ru/SiO₂ catalysts, 107, 338

oxidation

to acrolein over Fe-Sb-Ti-O catalysts, 107, 307 over MoO₃ catalysts

determination of reaction active sites, 106, 188 role of catalyst crystal face, 104, 71

partial, over Mo-Pr-O catalysts, 107, 325

reactions on lanthana, 105, 199

reactions at Mg(0001) surfaces, role of surface oxygen, 106, 538

Propylene oxide

polymerization over hexacyanometallate salts, 105, 163

Protons

ring, role in analysis of perylene radical adsorption on Al_2O_3 and SiO_2 – Al_2O_3 powders by electronnuclear double-resonance spectroscopy, 106, 500

Pseudocumene

conversion over Al₂O₃-pillared montmorillonite, effect of spillover hydrogen, 106, 38

Pumice

support of monodisperse colloidal metal particle catalysts, behavior in but-1-ene hydrogenation, 103, 95

Pyridine

TPD over crystalline AlPO₄-5 molecular sieve, 103,

R

Radioisotopes

analysis of CO hydrogenation over Rh catalysts, 106, 464

¹⁴C, tracer studies of thiophene hydrodesulfurization over clean and carbided Mo(100) singlecrystal surface, 106, 93

tracer studies of CO hydrogenation, analysis of transient response data from, 104, 147

Raman spectroscopy

laser

NiO/ γ -Al₂O₃ catalysts in situ, 103, 224 TiO₂-Al₂O₃ and Co-Al₂O₃-TiO₂ catalysts, 106, 362

Mo/TiO₂ catalysts, 106, 85

surface-enhanced, ethylene-O₂ interactions with Ag/Al₂O₃ and Ag/SiO₂ catalysts, 103, 188

Redispersion

chlorinated Al₂O₃-supported Ir catalysts, simulation, **103**, 140

Pt/Al₂O₃ by film formation, 108, 77

Reduction

activity of WO₃/Al₂O₃ catalysts, XPS, 107, 522 behavior of γ -Bi₂MoO₆, 108, 247

-decomposition, effect on Ru particle size in Ru/ zeolite catalysts, 106, 318

La_{1-y} M_y CoO₃ perovskite (M = Sr,Th), bulk measurements, **105**, 95

magnetite by H₂, formation of ammonia synthesis catalyst. **103**. 1

NO_x with NH₃ over MoO₃ catalysts, effect of catalyst grain morphology, **103**, 394

-oxidation treatment of

Rh/nonporous silica spheres, 108, 444

Rh/SiO₂ catalysts, effect on morphology, 107, 535

Tb oxides, effects of additives, 103, 216

tive properties of Ru/SiO₂ catalysts, **103**, 492

Rhenium

Al₂O₃-supported catalysts, characterization and catalytic function of Re⁰ and Re⁴⁺, 106, 263

catalyst for H₂-O₂ reaction, OH radical desorption, comparison with Pt, Pd, Ir, and Ni catalysts, 107, 548

-Ni catalysts, unsupported, modified by CaO, characterization and catalytic activity, 103, 105

-Pt/Al₂O₃ catalysts

characterization and catalytic function of Re⁰ and Re⁴⁺, **106**, 263

methylcyclohexane and n-heptane reactions, 107, 490

and PtRe, Al₂O₃- or SiO₂-supported catalysts, isotope exchange and hydrogenolysis of cyclopentane, **106**, 417

SiO₂-supported catalysts, methyl chloride hydrogenolysis, 103, 220

Rhenium salts

-zeolite A, synthesis and catalysis, 103, 520 Rhodium

aggregates in Rh-Y support, CO-induced disintegration and in situ synthesis of Rh carbonyl clusters, 104, 279

Al₂O₃-supported catalysts

adsorption of CO formed during H₂-CO₂ interaction, IR spectroscopy, **104**, 312

water-gas shift reaction, kinetic analysis, 106, 458

 B cluster anion and rare earth cations, metal cluster compounds, catalysis of heterogeneous olefin hydrogenation, 106, 292

catalyst for CO hydrogenation, analysis using isotopic tracers, 106, 464

highly dispersed catalyst, particle size determination by H₂ chemisorption and EXAFS, 105, 26 Nb₂O₅-supported catalysts, CO₂ hydrogenation at atmospheric pressure, **104**, 339

one-dimensional ordering on TiO₂(110) surface, implications, letter to editor, 104, 252

polycrystalline foil, CO hydrogenation, enhancement by TiO_x overlayers, **106**, 401

pumice-supported catalysts, behavior in but-1-ene hydrogenation, 103, 95

SiO₂-supported catalysts

cyclopentane exchange with D₂, NMR spectroscopy, **104**, 480

K-promoted, adsorption and reaction of CO and H_2 , 105, 432

methyl chloride hydrogenolysis, 103, 220

morphology, effects of oxidation/reduction treatments, 107, 535

oxidation-reduction treatment, 108, 444

-zeolite A, synthesis and catalysis, 103, 520

Rhodium oxide

platelets supported on Al₂O₃ catalysts, electron diffraction and anomalous X-ray diffraction, **106**, 549

Ruthenium

Al₂O₃-supported catalysts

CO hydrogenation, selectivity under transient conditions, **105**, 499

EXAFS using synchrotron radiation, 107, 263 and Ru-Mo/Al₂O₃ catalysts, synthesis and XPS, 107, 482

surface area measurements by H₂ chemisorption, effects of adsorbed Cl, 106, 166, 176

-Au catalyst particles, microdiffraction study, 108, 199

catalyst for cyclopropane reactions with H₂, structure sensitivity, **108**, 495

 Co catalysts, reductive carbonylation of ethanol, 103, 37

-Fe model catalysts supported on Mg hydroxide carbonate, Mössbauer spectroscopy, 108, 112

-Fe/SiO₂ catalysts, Mössbauer spectroscopy and ESR, 108, 259

Ru(0001) and Cu/Ru(0001) surfaces, cyclohexane hydrogenolysis and dehydrogenation, kinetics, 104, 347

Ru(001) surface, CO dissociation and C-D interaction, 105, 55

SiO₂-supported catalysts

chemisorptive properties, effects of reduction temperature and Cl, 103, 492

CO hydrogenation

C₄H₈ effects, 108, 63

propylene effects, 107, 338

methyl chloride hydrogenolysis, 103, 220

zeolite-supported catalysts, particle size, effects of decomposition/reduction, 106, 318

Ruthenium carbonyl

halide-supported catalysts, CO homogeneous hydrogenation, aldehyde intermediates, 105, 478 Ruthenium oxide

mobility on Pt, pulsed field desorption mass spectrometry, 108, 268

Rutile, see Titanium dioxide, rutile

s

Salts

hexacyanometallate, use as alkene-oxide polymerization catalysts and molecular sieves, **105**, 163 Semiconductors

metal oxide, photocatalytic activities for ¹⁸O₂ isotope exchange and oxidation reactions, **106**, 295 Silanol

internal groups in ZSM-5, confirmation and annealing by steaming, letter to editor, 104, 484

Silica, see Silicon dioxide

Silicon

 Al high-ratio zeolites, catalytic activities in n-heptane cracking, 107, 288

-substituted Y zeolite, Fe-exchanged, Mössbauer spectroscopy and catalytic activity, **104**, 381 Silicon dioxide

-Al₂O₃

adsorption of perylene radicals, electron-nuclear double-resonance spectroscopy, **106**, 500

ratios of faujasite, effect on coke selectivity during fluid catalytic cracking, 106, 410

and SiO₂-supported Pd catalysts for benzene hydrogenation, kinetics, **107**, 129

support of

Pd catalysts, effect on heats of adsorption of H₂, **104**, 1

reduced MoO₃ catalysts, ethene and ethane homologation, **106**, 354, **108**, 143

zeolite catalysts, design for triangular cracking reactions, 106, 116

-η-Al₂O₃, support of Pd catalysts, effect on heats of adsorption of CO, **104**, 17

 -AIPO₄, support of Pd catalysts, cyclohexene gasphase disproportionation, optimization, 108, 487

effect on catalytic properties of $V_2O_5-M_2S_2O_7$ (M = K,Na) melts in oxidation of SO_2 , 103, 160

-ethanol-Na₂O-Al₂O₃-water system, synthesis of ZSM-5 zeolites, **107**, 317

glass, support of Pt films during thermal treatment in H_2 and O_2 atmospheres, dispersion changes, 105, 213

H₂ spillover

induction of ethylene hydrogenation and H₂-D₂ exchange, 104, 288

from point source, scanning FTIR spectroscopy, 106, 378

-Nb₂O₅ surface oxides in thin films, morphology and structure, 108, 383

nonporous spheres, support of Rh crystallites, oxidation-reduction treatment, 108, 444

-Pt-WO₃ catalysts, characterization, 107, 114

reaction center, reevaluation, 103, 496 sulfated, FTIR spectroscopy, 107, 232 support of

Ag catalysts, interaction with ethylene-O₂ mixtures, surface-enhanced Raman study, **103**, 188 alkali-promoted Mn catalysts, oxidative conversion of methane to higher hydrocarbons, **103**, 311

Cu catalysts

CO₂ hydrogenation at atmospheric pressure, 104, 339

dispersion, analysis by ⁶³Cu NMR, **107**, 583 prepared by ion-exchange technique, structure, **108**, 323

Fe₂O₃ catalysts, synthesis and characterization, **106**, 428

FeRu and FePt catalysts, Mössbauer spectroscopy and ESR, 108, 259

heteropolyacid catalysts, methane oxidation, 106, 512

metal catalysts, methyl chloride hydrogenolysis, 103, 220

Mo catalysts

partial oxidation of methanol to formaldehyde, 103, 55

photoreduction with CO, 107, 8

static secondary ion mass spectroscopy, 105, 175

Ni catalysts

deactivation during CO methanation and disproportionation, 107, 275

TPD of deuterated formic acid, 104, 424

Pd catalysts

effect on heats of adsorption of H₂ and CO, **104**, 1. 17

interactions with H₂ and CO, dispersion effects, 103, 46

Pt catalysts

ethylene chemisorption, high-resolution solidstate NMR, 108, 15

formaldehyde oxidation, evidence for CO intermediate, 105, 258

n-hexane hydrogenolysis, comparison with TiO₂ support, **107**, 364

for methylcyclopentane hydrogenolysis, comparison with TiO₂ support, 107, 351

and Re, and PtRe catalysts, isotope exchange and hydrogenolysis of cyclopentane, 106, 417

for skeletal reactions of hydrocarbons, soluble Pt levels, 103, 280

Pt-WO₃ model catalysts, overlayer formation, TEM, 108, 304

reduced MoO₃ catalysts, homologation, hydrogenolysis, and dehydrogenation of C₂H₆, 108, 143

Rh catalysts

K-promoted, adsorption and reaction of CO and H_2 , 105, 432

morphology, effects of oxidation/reduction treatments, 107, 535

Rh and Ni catalysts, cyclopentane exchange with D₂, NMR spectroscopy, **104**, 480

Ru catalysts

chemisorptive properties, effects of reduction temperature and Cl, 103, 492

CO hydrogenation, effect of propylene and 1butene, 107, 338; 108, 63

surface Brønsted and Lewis acid sites, generation by addition of dopant cations, 105, 285

-TiO₂ mixed oxides, acidic, characterization and use as supports for Ni catalysts, **105**, 511

Silver

Ag(111)

decomposition of N_2O and oxidation of ethylene by N_2O , 104, 156

support of

Cs catalysts with alkali promotors, structure, effect of preparation method, 106, 301

ethylene oxide adsorption, isomerization, and combustion, effects of Cl and Cs promotors, 106, 54

Al₂O₃-supported catalysts, interaction with ethylene-O₂ mixtures, surface-enhanced Raman study, **103**, 188

 -α-Al₂O₃-supported catalysts, ethylene oxidation by N₂O, 104, 156

-Au alloy catalysts, ethylene oxidation, 108, 161
 catalyst for ethylene epoxidation, unsteady and steady state kinetics, 105, 81

foil, oxygen-preconditioned, ethene oxidation kinetics, 105, 39

-Pd/Al₂O₃ catalysts, synergism in methanol and CO oxidation, 103, 419

SiO₂-supported catalysts

interaction with ethylene-O₂ mixtures, surfaceenhanced Raman study, 103, 188

methyl chloride hydrogenolysis, 103, 220

Sintering

chlorinated Al_2O_3 -supported Ir catalysts, simulation, 103, 140

in unsupported Ni-Re catalyst system, effect of CaO, 103, 105

Sodium mordenite

catalysis of methylamine synthesis and equilibration, 103, 20

Sodium oxide

-ethanol-Al₂O₃-SiO₂-water system, synthesis of ZSM-5 zeolites, **107**, 317

Solids

high-surface-area, studies of agglomeration and determination of shape, 106, 202

transport phenomena, role in laboratory catalytic studies, 105, 245

Spectroscopy, see also specific methods

electron-nuclear double-resonance, analysis of perylene radical adsorption on Al₂O₃ and SiO₂–Al₂O₃ powders, **106**, 500

Spheres

Al₂O₃, containing Ni particles, control of impregnation profile, **104**, 323

Stannic oxide

support of MoO₃ catalysts: calcination of mechanical mixtures, 105, 445

Statistical methods

models for ensemble control by alloying and poisoning catalysts

assumptions and derivations, 104, 454

comparison with Monte Carlo simulations and experimental results, 104, 466

Steam

annealing of internal silanol groups in ZSM-5, letter to editor, 104, 484

gasification, activity of Fe in, effect of crystal structure, 104, 233

reforming reaction, atmospheric conditions, simulation of supported metal catalysts in using model catalysts, 107, 23

Strontium

La_{1 - y}Sr_yCoO₃ perovskite

bulk and surface reduction studies, 105, 95

CO₂ hydrogenation activity, 105, 107

Structure

bulk changes of Fe₉₁Zr₉ amorphous precursor for ammonia synthesis catalyst during transition to active catalyst, **107**, 221

Nb₂O₅-SiO₂ surface oxides in thin films, **108**, 383 sensitivity in heterogeneous catalysis: activity and selectivity, remarks, **107**, 248

stability of aluminum phosphate catalytic materials, compositional effects, 105, 521

Styrene

oxyhydrative scission over V₂O₅-MoO₃ catalyst, **104**, 359

Sugars

reducing, effect on homogeneous catalytic condensation of methylene glycol, **103**, 239

Sulfidation

effect on cumene conversion over γ -Al₂O₃-based catalysts containing F, Co, and Mo additives, 106, 544

Sulfonic acid resin

catalysis of isopentene synthesis in acetone environment, thermodynamics and kinetics, 103, 177

Sulfur

adsorbed on

Mo(100) single crystal surface, role in thiophene hydrodesulfurization, 107, 103

Pt surface, effect on catalysis of ethylene hydrogenation reaction, 104, 240

-aided metal-support interactions, in Pt/Al₂O₃-Cl catalysts, 106, 73

poisoning of Pt(110) single crystals during 1,3-butadiene hydrogenation, 107, 445

poisoning resistance of Pt/Al₂O₃ catalysts, effect on cyclohexane dehydrogenation, 105, 144

Synchrotron radiation

in EXAFS characterization of Ru/Al₂O₃ catalysts,

Sulfur dioxide Т oxidation over K/V and Cs/V catalysts Tantalum kinetics, comparison, 103, 126 dopant for Pt/TiO₂ catalysts, effect on chemisorpat low temperatures, rate limiting factors, 104, tive behavior, 103, 320 TEM, see Transmission electron microscopy $V_2O_5-M_2S_2O_7$ (M = K,Na) melts, effect of SiO₂, Temperature **103**, 160 calcination, effect on surface exposure of NiCo proradicals, formation on Ni/γ-Al₂O₃ catalysts, ESR, moters in Mo/Al₂O₃ catalysts, 103, 228 103, 506 heat treatment in H2 and O2 atmospheres of Pt sup-Sulfuric acid ported on SiO₂ glass, dispersion changes, 105, hydrogenation of NO over Pt/C catalysts hydroxylamine formation, 106, 494 low, effect on SO₂ oxidation over K/V and Cs/V microstructural study, 106, 483 catalysts, 104, 186 Surface area Temperature-programmed desorption copper, measurement by reactive frontal chromadeuterated formic acid over Ni/SiO2 catalysts, 104, tography, 103, 79 oxide supports for catalytic combustion, effect of oxygen diffusion in Mo₂C, 107, 393 additives, 103, 385 pyridine over crystalline AlPO₄-5 molecular sieve, Ru/Al₂O₃ catalysts, determination by H₂ chemisorp-**103**. 115 tion, effect of adsorbed Cl, 106, 166, 176 Temperature-programmed reduction unsupported Ni-Re catalysts, effect of CaO, 103, CeO₂ crystallite size, 103, 502 105 and Mössbauer spectroscopy, combined in situ anal-Surface exposure yses of Fe/Al₂O₃ catalysts, 106, 440 NiCo promoters in Mo/Al₂O₃ catalysts, effect of caloxygen diffusion in Mo₂C, 107, 393 cination temperature, 103, 228 Terbium oxides Surfaces oxidation and reduction, effects of additives, 103, amorphous 216 Fe₉₁Zr₉ Thermal stability mechanism of N2 adsorption and ammonia syn-Al phosphate catalytic materials, compositional efthesis kinetics, 108, 467 fects, 105, 521 morphological changes under ammonia synthedelaminated clay cracking catalyst, 104, 331 sis conditions, 108, 452 Thermal transport O₂-treated Ni-B films, characterization, 108, 256 preparation of low-concentration precious metal Au-Pt(111) and -Pt(100) alloys, structure sensitivity catalysts, 106, 307 in n-hexane conversion, 103, 208 Thermodynamics chemical changes of Fe91Zr9 amorphous precursor isopentene hydration in acetone environment over for ammonia synthesis catalyst during transisulfonic acid resin catalyst, 103, 177 tion to active catalyst, 107, 221 THF, see Phentydrone Cu(111), water-gas shift reaction kinetics, 104, Thiophene 109 deuterodesulfurization over MoS2 and reduced Mo Fe single crystals, restructuring for NH₃ synthesis, sulfide catalysts, reaction mechanism, 103, effects of Al₂O₃ and K₂O, 103, 289 $La_{1-\nu}M_{\nu}CoO_{3}$ perovskite (M = Sr,Th), reductionhydrodesulfurization over clean and carbided Mo(100) single-crystal surface, induced changes, 105, 95 radiotracer and catalytic study, 106, 93 Mg(0001), propylene reactions, role of surface oxy-Mo(100) crystal surface gen, 106, 538 MoO₃ crystals, evidence for short-range order and kinetics and mechanism, 107, 92 role of adsorbed S and mechanism of desulfursteps, 103, 200 roughness, role in ammonia synthesis over Fe cataization step, 107, 103 NiMo/Al₂O₃, poisoning by V, EPR and metal solid lysts, 103, 213 SiO₂, Brønsted and Lewis acid site generation by NMR analysis, 106, 525 addition of dopant cations, 105, 285 Thorium tungsten carbide, effect on H2 chemisorption, 103, Co catalysts for synthesis of light olefins from CO-H₂ mixtures at atmospheric pressure, 105, 1 30

La₁ - ,Th,CoO₃ perovskite

bulk and surface reduction studies, 105, 95 CO₂ hydrogenation activity, 105, 107

Thorium oxide

support of CuO and CuO-ZnO catalysts promoted with K₂CO₃, synthesis of higher alcohols, **104**, 434

Tin

-Pt/Al₂O₃ catalysts

adsorption and hydrogenation of benzene, ethylene, and 1-hexene, 103, 249

alloy formation, in situ X-ray diffraction, 106, 449 CO adsorption, 103, 249

Titania, see Titanium dioxide

Titanium

-Fe-Sb-O catalysts, propylene oxidation to acrolein, 107, 307

Titanium alkoxide

supported catalysts, ethylene dimerization, 105, 187

Titanium dioxide

adsorption of heptamolybdate ions, 107, 579

-Al₂O₃ and -Al₂O₃-Co catalysts, characterization, 106, 362

anatase, support of Pt catalysts, strong metal-support interactions, microcalorimetric study, **104**, 136

-covered Pt foil, methanation kinetics, **105**, 373 diffusion and adsorption on Pt, role of strong metal-support interactions, **103**, 426

overlayers on Rh foil, enhancement of CO hydrogenation, **106**, 401

polycrystalline films, Pd particle photodeposition and oxidation in air, HREM, 103, 436 rutile

support of Ni catalysts, effects of heating in H₂ and O₂ atmospheres, 104, 259

TiO₂(110) surface, one-dimensional ordering of Rh, implications, letter to editor, **104**, 252

-SiO₂ mixed oxides, acidic, characterization and use as supports for Ni catalysts, **105**, 511 support of

cation-doped Pt catalysts, chemisorptive behavior, role of dopant-induced metal-support interactions, 103, 320

CuO catalysts promoted with K₂CO₃, synthesis of higher alcohols, 104, 434

Mo catalysts, Raman spectroscopy, 106, 85 MoO₃ catalysts: calcination of mechanical mixtures, 105, 445

Pd catalysts

for benzene hydrogenation, kinetics, 107, 129 effect on heats of adsorption of H₂ and CO, 104,

in strong metal-support interaction state, methanation activity, letter to editor, 108, 501 Pt catalysts

CO oxidation, effects of TiO₂ crystal phases, FTIR spectroscopy, 105, 386

n-hexane hydrogenolysis, comparison with SiO₂ support, 107, 364 illuminated, regioselective isotope exchange between propane and deuterium below room temperature, 108, 426

for methylcyclopentane hydrogenolysis, comparison with SiO₂ support, 107, 351

V₂O₅ catalysts prepared by flash-drying for toluene ammoxidation, characterization, **106**, 251

 -V catalysts, toluene oxidation and ammoxidation in flow reactor, FTIR spectroscopy, 106, 471

-ZrO₂ support of CoO-MoO₃ hydrodesulfurization catalyst, evaluation, 108, 401

-ZrO₂-V₂O₅ ternary oxides, dehydrogenation and isomerization of cyclohexane, role of surface acidity and basicity, 107, 195

Toluene

alkylation with methanol over

alkali cation-exchanged zeolites, in situ IR spectroscopy, 104, 59

X zeolites in different alkali cation forms, 107,

ammoxidation over V₂O₅/TiO₂ catalysts prepared by flash-drying, catalyst characterization, **106**, 251

ethylation on ZSM zeolites, 105, 227

oxidation and ammoxidation over V-TiO₂ catalysts in flow reactor, FTIR spectroscopy, **106**, 471

TPD, see Temperature programmed desorption

TPR, see Temperature-programmed reduction Transition metals

γ-Al₂O₃-supported monometallic and bimetallic catalysts, functional selectivity for C-O hydrogenolysis, 104, 413

first row sulfides, promoting effect on MoS₂ hydrodesulfurization activity, theoretical and experimental analysis, 98, 17; comment, 104, 256

oxides supported on Al₂O₃, as acid cracking catalysts, periodic trends and relationship to activity and selectivity, **107**, 463

Transmission electron microscopy

MoO₃ and MoS₂ catalysts on thin-film Al₂O₃ support, **103**, 366

overlayer formation in Pt-WO₃/SiO₂ model catalysts, **108**, 304

pillared and delaminated hectorite catalysts, 107, 557

Transport phenomena

role in laboratory catalytic studies, 105, 245

Trimethylamine

synthesis and equilibration on Na-mordenite, 103, 20

1,2,4-Trimethylbenzene, *see* Pseudocumene 2,4,4-Trimethylpentene

reaction over H-Y zeolites, kinetics, 108, 346 Tungsten

dopant for Pt/TiO₂ catalysts, effect on chemisorptive behavior, 103, 320

 Ni/Al₂O₃ catalysts, aniline hydrodenitrogenation, 105, 254 Tungsten carbide

chemisorption of H₂, effects of surface composition, 103, 30

Tungsten trioxide

Al₂O₃-supported catalysts, reduction and metathesis activity, XPS, **107**, 522

-Pt/SiO₂ catalysts

characterization, 107, 114

overlayer formation, TEM, 108, 304

12-Tungstophosphoric acid

SiO₂-supported catalysts, methane oxidation, 106, 512

12-Tungstosilicic acid

SiO₂-supported catalysts, methane oxidation, 106, 512

V

Vanadium

- -Mg-O catalysts, butane oxidative dehydrogenation, 105, 483
- -P-O catalysts, stability during maleic anhydride synthesis, 104, 99
- poisoning of thiophene hydrodesulfurization over NiMo/Al₂O₃ catalysts, EPR and metal solid NMR analysis, **106**, 525

support of

Cs and K catalysts, SO₂ oxidation

kinetics, comparison, 103, 126

at low temperatures, rate limiting factors, 104, 186

-TiO₂ catalysts, toluene oxidation and ammoxidation in flow reactor, FTIR spectroscopy, 106, 471

Vanadium pentoxide

-Al₂O₃-Al-coated catalysts, partial oxidation of 1,3-butadiene

pore length effects on product selectivity, 105,

products and reaction routes, 105, 10 chemisorption of O₂, kinetics, 107, 503

-P₂O₅ catalysts for vapor-phase aldol condensation of formaldehyde with acetic acid, **107**, 201

 $-M_2S_2O_7$ (M = K,Na) melt, for SO₂ oxidation, catalytic properties, effect of SiO₂, **103**, 160

TiO₂-supported catalysts prepared by flash-drying for toluene ammoxidation, characterization, 106, 251

-TiO₂-ZrO₂ ternary oxides, dehydrogenation and isomerization of cyclohexane, role of surface acidity and basicity, 107, 195

Vanadyl tetraphenylporphin

interaction with aluminosilicate cracking catalysts, 108, 214

Vapor pressure

measurements on MoO₃/Al₂O₃, 108, 175

Void space

intracrystalline, structure of molecular sieves and

other catalysts, analysis using 1-methyl-2-ethylbenzene. 108, 433

Volume

changes of methylene glycol during homogeneous catalytic condensation, 103, 474

W

Water

and D₂O and CO₂, alkali-catalyzed C gasification, unification of reaction rates, 107, 209

-ethanol-Na₂O-Al₂O₃-SiO₂ system, synthesis of ZSM-5 zeolite, 107, 317

-gas shift

for chromia-promoted magnetite, implications from isotopic exchange measurements of CO and CO₂ interconversion and adsorption/desorption rates, 103, 65

over Cu(111) surface, reaction kinetics, 104, 109 over Rh/Al₂O₃ catalysts, kinetic analysis, 106, 458 vapor, effect on CO₂ photoassisted reduction by H₂ over metal oxides, 104, 246

Х

XPS, see X-ray photoelectron spectroscopy X-ray diffraction

alloy formation over Pt-Sn-Al₂O₃ catalysts, 106, 449

anomalous, Rh₂O₃ platelets on Al₂O₃, **106**, 549 LaRhO₃ catalysts, **103**, 407

methanol synthesis catalysts derived from rare earth-copper alloys, 106, 216

Pt-WO₃-SiO₂ catalysts, 107, 114

TiO₂-Al₂O₃ and Co-Al₂O₃-TiO₂ catalysts, **106**, 362 X-ray photoelectron spectroscopy

direct process contact masses, letter to editor, 103, 232; reply, 103, 236

LaRhO₃ catalysts, 103, 407

MoO₃/Al₂O₃ catalysts in oxide and reduced forms, 104, 202

MoO₃ and MoS₂ catalysts supported on thin-film Al₂O₃, 103, 366

Pt-WO₃-SiO₂ catalysts, 107, 114

reduction behavior and metathesis activity of WO₃/Al₂O₃ catalysts, **107**, 522

Ru/Al₂O₃ and Ru-Mo/Al₂O₃ catalysts, **107**, 482 species distribution in supported metal catalysts, **103**, 151

TiO₂-Al₂O₃ and Co-Al₂O₃-TiO₂ catalysts, 106, 362

Z

Zeolites

A, transition metal-containing, synthesis and catalysis, 103, 520

- Cs-X, catalysts for toluene alkylation with methanol, in situ IR spectroscopy, 104, 59
- diuternal Y, catalytic properties and intracrystalline void space structure, analysis using 1-methyl-2ethylbenzene, 108, 433
- faujasite, composition effects on coke selectivity during fluid catalytic cracking, 106, 410
- Fischer-Tropsch catalysts, dispersed Co-containing, characterization, 106, 47
- H-mordenite, catalytic properties and intracrystalline void space structure, analysis using 1methyl-2-ethylbenzene, 108, 433
- H-Na-Y, protonic centers, butylamine deamination mechanism, 104, 31
- H-Na-ZSM-8, acidity and catalytic properties, effects of H⁺ exchange, pretreatment conditions, and poisoning of stronger acid sites, **105**, 416

H-Y

- catalysts for cracking of paraffins hydrogen transfer reactions, **107**, 451 reaction kinetics, **104**, 80
- catalytic properties and intracrystalline void space structure, analysis using 1-methyl-2-ethylbenzene, 108, 433
- catalytic reactions of cyclooctane and ethylcyclohexane, 107, 571
- deactivation during *n*-heptane cracking, **106**, 235 and H-β, with high Si/Al ratios, catalytic activities in *n*-heptane cracking, comparison, **107**, 288
- methanol-to-olefin transformation, primary reaction steps, 108, 208
- reactions with C_8 olefins, kinetics, 108, 346 support of metal catalysts for CO hydrogenation, secondary reactions, effect of alkali cations, 107, 471

H-ZSM-5

- adsorption of simple alcohols, IR spectroscopy, 105 455
- catalytic properties and intracrystalline void space structure, analysis using 1-methyl-2-ethylbenzene, 108, 433
- catalyzed formation of ethylene from methanol or higher olefins, letter to editor, 103, 524; response, 103, 526
- and H-Y, deactivation modes during *n*-heptane cracking, comparisons, **106**, 242
- methanol conversion: yield studies and ³H NMR analysis of routes to ethylene production, **108**, 153
- methanol-to-olefin transformation, primary reaction steps, 108, 208
- and Ni-ZSM-5, decomposition of decanal and 1-decanol, 103, 87
- K-X, catalysts for toluene alkylation with methanol, in situ IR spectroscopy, 104, 59
- M, Fe-exchanged, interaction with NO, IR and Mössbauer spectroscopy, 108, 233
- mordenite, HF-treated, acidity and activity, 103, 399

- Mo-Y, prepared by aqueous ion exchange, characterization, 108, 283
- Na-Y, Mo-impregnated, Mo migration into intracrystalline cavities, 108, 334
- Rb-X, catalysts for toluene alkylation with methanol, *in situ* IR spectroscopy, **104**, 59
- Rh-Y, support of Rh aggregates, CO-induced disintegration and in situ synthesis of Rh carbonyl clusters, 104, 279
- SiO₂-Al₂O₃-supported catalysts, design for triangular cracking reactions, **106**, 116
- support of Ru catalysts, Ru particle size, effects of decomposition/reduction, 106, 318
- X, with different alkali cation forms, alkylation of toluene with methanol, 107, 296

Y

- and A-type, HREM, 103, 170
- catalytic activity for gas-oil cracking, effects of dealumination by various methods, 108, 135

Fe-exchanged

- interaction with NO, IR and Mössbauer spectroscopy, 108, 233
- Si-substituted, Mössbauer spectroscopy and catalytic activity, **104**, 381
- Pt clusters in channels, computer-simulated HREM images, 103, 466
- support of Co catalysts, CO hydrogenation, metal loading effects, 106, 386
- ZSM, support of toluene ethylation, 105, 227 ZSM-5
 - ethene and propene conversion to higher hydrocarbons, 105, 270
 - Fe-exchanged, interaction with NO, IR and Mössbauer spectroscopy, 108, 233
 - internal silanol groups, confirmation and annealing by steaming, letter to editor, 104, 484
 - support of Fe catalysts in methanol deoxygenation with CO, 103, 480
 - synthesis using ethanol template system, 107, 317
- and ZSM-11, B-substituted, properties, 108, 1 Zinc oxide
 - -CuO catalysts supported on Al₂O₃, Cr₂O₃, or ThO₂ and promoted with K₂CO₃, synthesis of higher alcohols, 104, 434
 - support of Cu catalysts, formaldehyde conversion to methanol and methyl formate, 105, 352

Zirconia, see Zirconium oxide

Zirconium

amorphous Fe91Zr9

- mechanism of N_2 adsorption and ammonia synthesis kinetics, 108, 467
- surface morphological changes under ammonia synthesis conditions, 108, 452
- -Cu alloys, amorphous, activation, 108, 263
- Fe₉₁Zr₉ amorphous precursor for ammonia synthesis catalyst, bulk structural and surface chemical changes during transition to active catalyst, 107, 221

Zirconium oxide

- -based oxide supports for CoO combustion catalysts, effect of additives on support surface area, 103, 385
- -TiO₂ support of CoO-MoO₃ hydrodesulfurization catalyst, evaluation, 108, 401
- -TiO₂-V₂O₅ ternary oxides, dehydrogenation and isomerization of cyclohexane, role of surface acidity and basicity, **107**, 195

Zirconium phosphate

and derived phases, catalytic activity in alcohol dehydration and butene isomerization, 103, 346