



JOURNAL OF MOLECULAR CATALYSIS A: CHEMICAL

PatentsALERT

This section contains abstracts of recently issued patents in the United States and published patent applications filed from over 90 countries under the Patent Cooperation Treaty and compiled in accordance with interest profiles developed by the Editors.

Further Information about the complete patents can be obtained from Reedfax Document Delivery System, 275 Gibraltar Road, Horsham, PA 19044, USA. Tel.: +1-215-441-4768, Fax: +1-215-441-5463. This is a 24-h, 7-days a week service.

Chemicals

5948243

CATALYST COMPRISING ALUMINUM BORATE AND ZIRCONIUM BORATE AND USE THEREOF IN A HYDROTREATING PROCESS

Kallenbach, Lyle R; Bartlesville, OK, UNITED STATES assigned to Phillips Petroleum Company

A composition comprises a hydrodesulfurization or hydrodenitrogenation, or both, catalyst component and a support component which comprises aluminum, zirconium, and a borate. A process for making the composition comprises the steps of (1) contacting an aluminum salt, a zirconium salt, and an acidic boron compound under a condition sufficient to effect the production of a support component comprising aluminum, zirconium, and borate and (2) combining a hydrodesulfurization or hydrodenitrogenation, or both, catalyst component with the support component. Also disclosed are processes for removing organic sulfur compounds or organic nitrogen compounds, or both, from hydrocarbon-containing fluids which comprise contacting a hydrocarbon-containing fluid, with a hydrogen-containing fluid, in the presence of a catalyst composition.

5948721

DISPERSING-TYPE CATALYST FOR HYDROCRACKING OF HEAVY OIL AND RESIDUUM, AND A METHOD FOR THE PREPARATION THEREOF

Yuansheng, Li; Jun, Wang; Lijing, Jiang; Zhongqing, Zhang; Jiduan, Liu; Shuyan, Ren; Bo, Zhao; Yongzhong, Jia; Fushun, CHINA assigned to China Petro-Chemical Corporation, Fushun Research Institute of Petroleum and Petrochemicals

This invention discloses a dispersing-type catalyst for catalytic hydrocracking of heavy oil and residuum, the preparation method thereof and a suspension bed hydrocracking process for hydrocracking of heavy oil and residuum using said catalyst. Said catalyst comprises 2 to 15 wt.% Mo, 0.1 to 2 wt.% Ni and 0.1–3 wt.% P. The preparation method comprises dissolving oxides or salts of metals such as Mo, Ni in water. The process comprises mixing the heavy oil and residuum feedstock with the catalyst, heating the mixture and introducing the mixture into a suspension bed reactor, performing the hydrocracking reaction at 380–460°C

under 10–15 MPa of hydrogen pressure, in which the catalyst is added in an amount to provide 150–1500 ppm active metals. The yield of light oil according to the process is more than 70 wt.%, substantially without coking.

5951848

PROCESS FOR HIGHLY SHAPE SELECTIVE DEWAXING WHICH RETARDS CATALYST AGING

Baker, Jr; Dougherty, Charles L; Thornton, Richard C; Morrestown, NJ, UNITED STATES assigned to Mobil Oil Corporation

This application discloses a process for catalytically dewaxing a feedstock whereby the aging of the dewaxing catalyst is minimized. A variety of feedstocks which possess moderate levels of nitrogen and sulfur may be dewaxed in this invention. The feed is treated by a catalyst system comprising two catalysts acting in synergistic combination, a hydrotreating catalyst and a dewaxing catalyst. The hydrotreating catalyst is preferably loaded with noble metals and is capable of operating at higher than usual space velocities. The dewaxing catalyst is downstream of the hydrotreating catalyst. The dewaxing catalyst further comprises a constrained intermediate pore crystalline material which is loaded with a noble metal.

5951849

RESID HYDROPROCESSING METHOD UTILIZING A METAL-IMPREGNATED, CARBONACEOUS PARTICLE CATALYST

Miller, Jeffrey T; Fisher, Ronald B; Marshbanks, Tracy L; Naperville, Geneva, Boling Brook, IL, UNITED STATES assigned to BP Amoco Corporation

A method for converting a hydrocarbonaceous feedstock to a lower boiling product is described which comprises suspending metal-impregnated carbonaceous particles in a reaction zone including hydrogen and the hydrocarbonaceous feedstock at hydrocracking conditions. The metal impregnated on the particles may be sulfided in the reaction zone. The impregnated particles are shown to be surprisingly selective catalysts, and anomalous ranges of particle size and concentration are identified. Methods for preparing the particles are additionally presented.

5954945**FLUID HYDROCRACKING CATALYST PRECURSOR AND METHOD**

Cayton, Roger H; Fisher, Ronald B; Miller, Jeffrey T; Waynick, John A; Naperville, Geneva, Naperville, Warrenville, IL, UNITED STATES assigned to BP Amoco Corporation

A method for converting a hydrocarbonaceous feedstock to a lower boiling temperature product is described, which comprises suspending metal sulfide particles and oxide particles in a reaction zone including hydrogen and the hydrocarbonaceous feedstock at hydrocracking conditions. The metal sulfide particles and the oxide particles are introduced into the reaction zone through particle precursor fluids which precipitate upon heating to form the particles. The metal sulfide particles contain sulfidable transition metals. The oxide particles contain oxidisable elements such as magnesium, aluminum, silicon, phosphorous, calcium, scandium, titanium, gallium, germanium, zirconium, cerium, and mixtures thereof and are not hydrogenation catalysts under the reactor conditions. The oxide particles resist being chemically reduced by reducing agents in the reaction zone. Surprisingly, the presence of the oxide particles is associated with a significant reduction of coke production in the reaction zone. A hydrogenation catalyst precursor comprising a hydrocarbonaceous feedstock, a sulfide particle precursor fluid, and an oxide particle precursor fluid is also described.

5954947**PROCESS FOR MILD HYDROCRACKING OF PETROLEUM CUTS USING A CATALYST CONTAINING AT LEAST TWO DEALUMINATED Y ZEOLITES**

Mignard, Samuel; George-Marchal, Nathalie; Benazzi, Eric; Kasztelan, Slavik; Chatou, Paris, Chatou, Rueil Malmaison, FRANCE assigned to Institut Francais du Petrole

A mild hydroconversion process for petroleum cuts using a catalyst comprising at least one matrix, at least one Y zeolite with a lattice parameter which is in the range 24.15 Å to 24.38 Å. (1 nm–10 Å.), at least one Y zeolite with a lattice parameter of more than

24.38 Å. and less than or equal to 24.51 Å., and at least one hydro-dehydrogenating element.

5954948**HYDROCARBON CONVERSION PROCESS USING A SULFUR TOLERANT CATALYST**

Galperin, Leonid B; Wilmette, IL, UNITED STATES assigned to UOP LLC

Hydrocarbon conversion processes are described which use a sulfur tolerant catalyst system. The catalyst is tolerant to large amounts (about 30,000 ppm sulfur) in the feedstream and comprises a first component which comprises at least one Group VIII metal dispersed on an inorganic oxide support and a second component comprising a metal phthalocyanine dispersed on an inorganic oxide support. Preferred Group VIII metals are platinum and palladium, while preferred metal phthalocyanines are cobalt or nickel phthalocyanine. Preferred inorganic oxide supports are molecular sieves, aluminas and mixtures thereof. Processes that can be carried out using this catalyst system include reforming, hydrocracking, dehydrogenation and isomerization.

5972201**HYDROCARBON CONVERSION CATALYST ADDITIVES AND PROCESSES**

Goolsby, Terry L; Mitchell, Maurice M; Ashland, KY, UNITED STATES assigned to Marathon Ashland Petroleum LLC

Magnetic separation of fluid cracking catalyst and magnetic hooks can be improved by adding antimony, in the feed or during catalyst manufacture, to enhance the magnetic susceptibility, thus increasing the separation efficiency of the older less active fluid cracking catalyst from the more desirable fraction for recycle. Antimony can also be used as a tag for determination of age distribution of said catalyst. Concentration levels of 0.005–15 wt.% antimony (Sb) on the catalyst or sorbent are preferred. The invention is particularly preferred on catalyst and sorbents which comprise at least about 0.001 wt.%, more preferably above about 0.01 wt.% iron, because the antimony has been found to enhance the magnetic susceptibility of iron-containing particulates.

5972204**PHOSPHOROUS-CONTAINING ZEOLITE WITH STRUCTURAL TYPE CON, ITS PREPARATION AND ITS USE FOR CATALYTIC CRACKING**

Corma Canos, Avelino; Benazzi, Eric; Caufriez, Herve; Diaz Cabanas, Maria Jose; Grande Casas, Maria Sol; Camblor Fernandez, Miguel Angel; Mabilon, Gil; Valencia, Chatou, Bougival, Valencia, Carrieres Sur Seine, FRANCE assigned to Institut Francais du Petrole

A phosphorous-containing zeolite with structural type CON in its aluminosilicate or borosilicate form contains at most 10% by weight of phosphorous. A process for its preparation is described, starting from existing zeolites (SSZ-26, SSZ-33 or CIT-1) or from beta zeolites and an organic structuring agent or template which is 1-*N,N,N*-trimethyl adamantammonium hydroxide or 2-*N,N,N*-trimethyl adamantammonium hydroxide. The zeolite is used for catalytic cracking of hydrocarbon feeds.

5972207**CATALYTIC REFORMING PROCESS FOR HEAVY CRACKED NAPHTHA**

Johns, William Floyd; Spring, TX, UNITED STATES assigned to Texaco, Inc

A large pore volume catalyst was used for reforming heavy cracked naphtha. The average pore diameter is preferably between about 110 to 150 Å. Improved catalytic stability and improved liquid yield was achieved. As a result of the improvement, a 101 RON debutanized naphtha reformat is produced at a reduced catalyst aging rate.

5976355**LOW RESIDENCE TIME CATALYTIC CRACKING PROCESS**

Johnson, Axel R; Gartside, Robert J; Ross, Joseph L; Duncan, Dennis A; North Babylon, Wellesley, Houston, Sharon, MA, UNITED STATES assigned to Stone and Webster Engineering Corporation

A process for producing liquid fuels from heavy hydrocarbons such as residual oil in which the cracking temperatures are in the range of 800°F to 1200°F, and the residence times are between 0.05 and 0.50 s.

5977425**METHOD FOR UPGRADING WAXY FEEDS USING A CATALYST COMPRISING MIXED POWDERED DEWAXING CATALYST AND POWDERED ISOMERIZATION CATALYST FORMED INTO A DISCRETE PARTICLE**

Brandes, Dee A; Zinkie, David N; Alward, Sandra Jane; Murphy, William J; Cody, Ian A; Ford, Thomas J; Calgary, Sarnia, Baton Rouge, CANADA assigned to Exxon Research and Engineering Company

It has been discovered that waxy feeds can be upgraded using a catalyst made by combining powdered dewaxing catalyst with powdered isomerization catalyst said mixture of powdered catalysts being formed into a discrete particle.

5986154**PROCESS FOR THE HYDROGENATION OF AROMATIC COMPOUNDS COMPRISING CHLORINE INJECTION, USING CATALYSTS BASED ON A NOBLE METAL**

Mignard, Samuel; Harle, Virginie; Kasztelan, Slavik; Marchal-George, Nathalie; Chatou, Rueil Malmaison, Paris, FRANCE assigned to Institut Francais du Petrole

The invention concerns a process for the hydrogenation of aromatic compounds contained in feeds with an initial boiling point of more than 100°C and which contain at least 10% by weight of aromatic compounds. It consists of introducing chlorine in a concentration of 0.5–500 ppm by weight with respect to the feed at a temperature of between 200°C and 450°C, a pressure in the range 1 to 25 MPa, an HSV of between 0.1 h⁻¹ and 10 h⁻¹ and a volume ratio of hydrogen to feed of 100–2000. The catalyst used is a noble metal type and contains less than 1% of at least one halogen. Preferably, the catalyst is fluorinated or chlorinated.

JOURNAL OF MOLECULAR CATALYSIS A: CHEMICAL-ORGANOMETALLIC CATALYSIS**5973174****PREPARATION OF TRANSITION METAL CATALYSTS FROM PHOSPHONIUM SALTS**

Wong, Pui Kwan; Rodriguez, Manuel Soler; Moxey, Andrew Allison; Houston, Richardson, TX, UNITED STATES assigned to Shell Oil Company

A method is provided to prepare a cationic transition metal catalyst, the method including the steps of providing a disubstituted phosphine selected from the group consisting of RPH and R_1R_2PH , wherein R is a divalent group selected from substituted and nonsubstituted hydrocarbon groups, R_1 and R_2 are independently selected from substituted and nonsubstituted hydrocarbon groups; combining the disubstituted phosphine with a salt of the formula R_3X_n wherein X is a good leaving group and is a weakly coordinating anion and R_3 is a substituted or nonsubstituted aliphatic hydrocarbon and n is 1, 2, or 3 to form a phosphonium salt of a formula selected from $R_3(RP^+H)_n nX^-$ and $R_3(R_1R_2P^+H)_n nX^-$; and combining the phosphonium salt with a transition metal salt of the formula MY_m wherein M is a transition metal, and Y is the anion of a weak acid thereby forming a cationic transition metal catalyst.

5977361**TRANSITION METAL-CATALYZED PROCESS FOR PREPARING N-ARYL COMPOUNDS**

Hartwig, John F; Mann, Grace; New Haven, CT, UNITED STATES assigned to Yale University

The present invention is directed to a process for the preparation of *N*-aryl compounds containing at least one unsaturated nitrogen atom, comprising reacting a compound having at least one unsaturated nitrogen atom with an arylating compound in the presence of a base and a transition metal catalyst under reaction conditions effective to form an *N*-aryl compound containing at least one unsaturated nitrogen atom, wherein the aryl moiety of the *N*-aryl compound is bonded to the at least one unsaturated nitrogen atom, the transition metal catalyst comprising a Group 8 metal and at least one chelating ligand selected from the group consisting of Group 15-substituted metallocenes, Group 15-substituted arylenes, unsaturated Group 15 heterocycles, Group 15-substituted alkanes, and combinations thereof. The process of the present invention a useful general method of *N*-arylation for the manufacture of pharmaceuticals, polymers, and the like.

5935897**MONOMODAL AND POLYMODAL CATALYST SUPPORTS AND CATALYSTS HAVING NARROW PORE SIZE DISTRIBUTIONS AND THEIR PRODUCTION**

Trubenbach, Peter; Hagemeyer, Alfred; Lauth, Gunter; Dingerdissen, Uwe; Brocker, Franz Josef; Flick, Kle-

mens; Ludwigshafen, Ratzenburg, Seeheim-Jugenheim, Herxheim, GERMANY assigned to BASF Aktiengesellschaft

Monomodal or polymodal catalyst supports or catalysts having a BET specific surface area of 0.01 to 250 m^2/g and a monomodal or polymodal pore size distribution having a mean pore diameter of 50 to 300,000 nm measured by the mercury pressure porosimetry method, wherein (a) from 10% to 95% of the pore volume is at 0.2 to 100 times the mean pore diameter and/or (b) from 10% to 80% of the pore volume is at 0.8 to 100 times the mean pore diameter and/or (c) from 50% to 95% of the pore volume is at 0.2 to 1 times the mean pore diameter and/or (d) from 50% to 80% of the pore volume is at 0.8 to 1 times the mean pore diameter and (e) the width at half height of the pore size distribution is less than 0.6 times the mean pore diameter, which are useful for the preparation of chlorine from hydrogen chloride in a non-steady-state Deacon process, for the reaction of ethylbenzene to give styrene in a non-steady-state oxydehydrogenation, for preparing aziridine from ethanolamine, in reductions, hydrogenations, oxidations, dehydrogenations, acid- or base-catalyzed reactions or reactions in a fluidized bed, for removing combustion residues from diesel exhaust gases and for removing NO_x from waste gases, in bioreactors together with bacteria and as biocatalyst supports with immobilized enzymes or microbes, and a process for producing said monomodal or polymodal catalyst support or catalyst.

5935898**MONOMODAL AND POLYMODAL CATALYST SUPPORTS AND CATALYSTS HAVING NARROW PORE SIZE DISTRIBUTIONS AND THEIR PRODUCTION**

Trubenbach, Peter; Hagemeyer, Alfred; Lauth, Gunter; Dingerdissen, Uwe; Brocker, Franz Josef; Flick, Klemens; Ludwigshafen, Ratzenburg, Seeheim-Jugenheim, Herxheim, GERMANY assigned to BASF Aktiengesellschaft

Monomodal or polymodal catalyst supports or catalysts having a BET-specific surface area of 0.01 to 250 m^2/g and a monomodal or polymodal pore size distribution having a mean pore diameter of 50 to 300,000 nm measured by the mercury pressure porosimetry method, wherein (a) from 10% to 95% of the pore volume is at 0.1 to 3 times the mean pore diameter

and/or (b) from 10% to 80% of the pore volume is at 0.4 to 3 times the mean pore diameter and/or (c) from 50% to 95% of the pore volume is at 0.1 to 1 times the mean pore diameter and/or (d) from 50% to 80% of the pore volume is at 0.4 to 1 times the mean pore diameter and (e) the width at half height of the pore size distribution is less than 0.5 times the mean pore diameter, which are useful for preparing chlorine from hydrogen chloride in a non-steady-state Deacon process, for the reaction of ethylbenzene to give styrene in a non-steady-state oxydehydrogenation, for preparing aziridine from ethanolamine, in reductions, hydrogenations, oxidations, dehydrogenations, acid- or base-catalyzed reactions or reactions in a fluidized bed, for removing combustion residues from diesel exhaust gases and for removing NO_x from waste gases, in bioreactors together with bacteria and as biocatalyst supports with immobilized enzymes or microbes, and a process for producing said monomodal or polymodal catalyst supports or catalysts.

5939351

CATALYSTS AND CATALYST CARRIERS OBTAINED BY TABLETING

Rubini, Carlo; Cavalli, Luigi; Battaglia, Novara, ITALY assigned to Montecatini Technologie s.r.l.

Catalysts and catalyst carriers, in the form of granules having a definite geometric form, characterized by porosity values such that at least 70% of the volume of the pores have a radius corresponding to the peak values of the porosity distribution curve. The catalysts and catalyst carriers are obtained by compression shaping, wherein the lubricant employed is applied to the molding of the chamber (external lubrication).

5952508

PROCESS FOR THE PREPARATION OF A HIGHLY ACTIVE AND SELECTIVE AMMOXIDATION CATALYST AND ITS USE IN PREPARING HETEROAROMATIC NITRILES

Rao, Panja Kanta; Rao, Kamaraju Seetha Rama; Rao, Vattikonda Venkata; Narayana, Kalevaru Venkata; Venugopal, Akula; Rao, Alla Venkata Rama; Subrahmanyam, Machiraju; Hyderabad, IN, UNITED STATES assigned to Council of Scientific and Industrial Research

This invention relates to a process for the preparation of highly active and selective ammoxidation catalyst of formula $(\text{VO})_2\text{P}_2\text{O}_7$, TiO_2 or $(\text{VO})_2\text{P}_2\text{O}_7$, Al_2O_3 , whose process comprises refluxing a vanadium source in the presence of alcohols; adding a source of phosphorous to form vanadyl pyrophosphate hydrate $(\text{VO})_2\text{H}_4\text{P}_2\text{O}_9$ or $(\text{VO})_2\text{P}_2\text{O}_{7.2}\text{H}_2\text{O}$; physical mixing of $(\text{VO})_2\text{H}_4\text{P}_2\text{O}_9$ with oxides selected from titania or alumina, and heating the resultant mixture in the presence of air at a temperature in the range of 300°C – 600°C for a period in the range of 1 to 10 h; and the use of said ammoxidation catalyst in the preparation of heteroaromatic nitrites.

5952529

CATALYST AND PROCESS FOR PRODUCING AMINES

Chang, Dane; Sherrod, Fred A; Sugar Land, Lake Jackson, TX, UNITED STATES assigned to The Dow Chemical Company

This invention includes catalysts comprising rhenium (atomic number 75), nickel, cobalt, boron and copper and/or ruthenium impregnated on a support material and a process for preparing said catalyst, said process comprising (i) impregnating a mixture of metals comprising rhenium, cobalt, copper and/or ruthenium, boron and nickel on a support material selected from the group consisting of alpha-alumina, silica, silica-alumina, kieselguhrs or diatomaceous earths, and silica-titanias; and (ii) activating said catalyst by heating the catalyst in the presence of hydrogen at an effective temperature preferably in the range of about 150°C to about 500°C for a sufficient period preferably from about 30 min to about 6 h. A further feature of the present invention is a method for producing amine products by the catalytic amination of alkane or arylalkane derivatives including epoxides, monols, diols, polyethers, polyols, alcoholamines, ketones, imino compounds iminoalcohols, ether alcohols, and mixtures thereof, said process comprising contacting said lower alkane or arylalkane derivatives with ammonia and/or reactant amine at an effective temperature preferably from 150°C to about 500°C and in the presence of hydrogen and the nickel-rhenium-cobalt-boron-copper and/or ruthenium catalyst as described hereinabove.

5953911**REGENERATION OF CATALYST / ABSORBER**

Guth, Eugene D; Campbell, Larry E; Wagner, Gregory J; Escondido, Knoxville, TN, UNITED STATES assigned to Goal Line Environmental Technologies LLC

Hydrocarbon in a carrier of nitrogen or steam is passed over a devitalized supported noble metal/alkali or alkaline earth catalyst/absorber, such as Pt on an alumina monolith coated with potassium carbonate, which has sorbed NO_x from engine exhaust to restore and regenerate the devitalized catalyst/absorber for reuse. The hydrocarbon undergoes a shift reaction to produce CO in situ, which is the reactant gas for the regeneration.

5955394**RECOVERY PROCESS FOR OXIDATION CATALYST IN THE MANUFACTURE OF AROMATIC CARBOXYLIC ACIDS**

Kelly, Michael D; Memphis, TN, UNITED STATES assigned to Mobile Process Technology Company

An improved separation process for the continuous catalytic oxidation of aromatic alkyls for the production of aromatic carboxylic acids in a liquid solvent medium, wherein the reactor product stream is withdrawn from the oxidation process, then separated to produce a product containing stream, mother liquor stream and a catalyst containing purge stream, which is then passed through a filtration system and series of sorption vessels to remove the oxidation catalyst and separate the impurities from the catalyst. The solvent is then separated from the reaction by-products by conventional distillation methods. The solvent is recycled to the process while the reaction by-product residue is disposed of by incineration. The oxidation catalyst is eluted from the ion exchange columns and returned to the process.

5972833**PREPARATION OF VANADIUM ANTIMONATE BASED CATALYSTS USING $\text{SnO}_2-x\text{H}_2\text{O}$**

Brazdil, Jr; James Frank; Bartek, Joseph Peter; Highland Heights, OH, UNITED STATES assigned to The Standard Oil Company

A method of preparing a catalyst having the elements and the proportions indicated by the following empirical formula: where A is one or more Ti, Sn,

where Sn is always present, D is one or more Li, Mg, Ca, Sr, Ba, Co, Fe, Cr, Ga, Ni, Zn, Ge, Nb, Zr, Mo, W, Cu, Te, Ta, Se, Bi, Ce, In, As, B, Al and Mn wherein m is 0.5 to 10 a is greater than zero to 10 d is zero to 10 x is determined by the oxidation state of the cations present, comprising making an aqueous slurry of a mixture of source batch materials comprising compounds of said elements to be included in the final catalyst, followed by drying and heat calcining the mixture to an active catalyst, wherein the source batch material for the tin is a solution that comprises $\text{SnO}_2 \cdot x\text{H}_2\text{O}$, wherein x greater than or equal to 0 dispersed in tetraalkyl ammonium hydroxide, wherein the tetraalkyl ammonium hydroxide is defined by the following formula: wherein 5 greater than or equal to n greater than or equal to 1, drying said slurry and calcining the mixture to an upper calcination temperature of at least 500°C.

5976356**ACID TREATED ZEOLITE CONTAINING BORON AND SILVER USED AS A CATALYST FOR CONVERTING HYDROCARBONS AND A METHOD OF MAKING AND USING SUCH CATALYST**

Drake, Charles A; Yao, Jianhua; Nowata, Bartlesville, OK, UNITED STATES assigned to Phillips Petroleum Company

A novel zeolite catalyst comprising an acid treated zeolite impregnated with silver and boron, a method of making such zeolite catalyst, and the use thereof for converting paraffin hydrocarbons to olefins and aromatics.

5981418**ZEOLITE BASED CATALYST CONTAINING ZINC, BORON AND PHOSPHORUS AND METHOD OF MAKING SUCH ZEOLITE BASED CATALYST**

Drake, Charles A; Wu, An-hsiang; Yao, Jianhua; Nowata, Bartlesville, OK, UNITED STATES assigned to Phillips Petroleum Company

A novel composition including either a zeolite or an acid leached zeolite containing boron, zinc and phosphorus, used in the conversion of hydrocarbons. The novel composition is prepared by a novel method including incorporating into a zeolite or an acid treated

zeolite material, preferably by use of a liquid solution, a zinc component, a boron component, and a phosphorus component.

5985785

COMPOSITION INCLUDING A CATALYTIC METAL-POLYMER COMPLEX AND A METHOD OF MANUFACTURING A LAMINATE PREFORM OR A LAMINATE WHICH IS CATALYTICALLY EFFECTIVE FOR SUBSEQUENT ELECTROLESS METALLIZATION THEREOF

Lane, Scott A; Yancey, Charlie F; Memphis, Germantown, TN, UNITED STATES assigned to Alpha Corporation

The inventive method provides a simple and economical method of manufacturing a laminate, which is catalytically effective for subsequent electroless deposition thereon of metals, such as copper, and which is useful as a substrate for printed circuit boards. Advantageously, the inventive method provides an improved laminate having a substantially uniform distribution of finely divided catalytic metal, $Me_{(0)}$, within a crosslinked synthetic polymer impregnant. A catalytic metal-polymer complex is formed between a salt of a catalytic metal and a crosslinkable synthetic polymer, optionally containing a monomeric reactive diluent, to provide a concentrate that may be worked up into an impregnating composition for impregnating reinforcing material therewith. The complex is then destroyed and the catalytic metal, such as palladium-II, reduced to elemental metal, such as palladium metal, $Pd_{(0)}$, during or after crosslinking of the polymer system under conditions effective for crosslinking the polymer system. Preferably destruction and reduction occur during crosslinking. The catalytic metal is a Group IB or Group VIII metal, preferably palladium or nickel. The crosslinkable synthetic polymer is an unsaturated polyester or polyvinyl ester.

5989648

PLASMA GENERATION OF SUPPORTED METAL CATALYSTS

Phillips, Jonathan; State College, PA, UNITED STATES assigned to The Penn State Research Foundation

The present invention relates to a method of producing catalytic materials, which comprises passing an

aerosol comprising a mixture of metal powder and support through a plasma torch.

5989787

ACTIVATING CATALYTIC SOLUTION FOR ELECTROLESS PLATING AND METHOD FOR ELECTROLESS PLATING

Kanoh, Osamu; Yoshida, Yasushi; Ogiso, Yoshifumi; Omihachiman, Shiga-ken, Otsu, JAPAN assigned to Murata Manufacturing Company Ltd

A hydrophilic activating catalytic solution for electroless plating is a mixture of lactate, palladium and alkaline medium. The solution enables depositing palladium catalyst in a short time radiation exposure and removing unwanted photo-sensitive film more effectively by water or the like. The lactate preferably comprises copper lactate and/or zinc lactate and the palladium salt is preferably palladium chloride.

JOURNAL OF MOLECULAR CATALYSIS A: CHEMICAL-ENVIRONMENTAL CATALYSIS

5948376

CATALYST FOR PURIFYING EXHAUST GASES

Miyoshi, Naoto; Tanizawa, Tuneyuki; Ishibashi, Kazunobu; Kasahara, Koichi; Tateishi, Syuji; Nagoya, Toyota, Ogasa-gun, JAPAN assigned to Toyota Jidosha Kabushiki Kaisha, Cataler Industrial Company

A catalyst for purifying exhaust gases includes a porous support, an NO_x storage component including at least one member selected from the group consisting of alkaline-earth metals, rare-earth elements and alkali metals, and loaded on the porous support, a noble metal catalyst ingredient loaded on the porous support, and disposed adjacent to the NO_x storage component, and ceria (CeO_2) disposed away from the noble metal catalyst ingredient. By disposing the noble metal catalyst ingredient adjacent to the NO_x storage component, the reduction reactions of NO_x can be facilitated in fuel-rich (i.e., oxygen-lean) atmospheres without being interfered by the ceria. By disposing the ceria away from the noble metal catalyst ingredient, oxygen, which has been stored thereon in fuel-lean (i.e., oxygen-rich) atmospheres, can be released from the ceria at a controlled rate in a controlled amount in fuel-rich (i.e., oxygen-lean) atmospheres, and thereby the released oxygen can be inhibited from reacting with HC and CO in fuel-rich

(i.e., oxygen-lean) atmospheres. Thus, the catalyst is improved in terms of NO_x purifying performance.

5951956

CATALYST FOR PURIFYING EXHAUST GAS AND METHOD FOR PURIFYING EXHAUST GAS

Muraki, Hideaki; Saiki, Motohisa; Adachi, Mariko; Matsumoto, Shinichi; Kanazawa, Takaaki; Katoh, Kenji; Iguchi, Satoshi; Kihara, Tetsuro; Tateishi, Syuji; Kasahara, Koichi; Aichi, Toyota, Sunto-gun, Mishima, Susono, Ogasa-gun, JAPAN assigned to Kabushiki Kaisha Toyota Chuo Kenkyusho, Toyota Jidosha Kabushiki Kaisha, Cataler Industrial Company Ltd

A catalyst for purifying an exhaust gas for simultaneously removing carbon monoxide, hydrocarbons and nitrogen oxides contained in the exhaust gas under an oxygen rich atmosphere, comprising a carrier composed of a porous material, and barium oxide, lanthanum oxide and platinum supported on the carrier, and a method for purifying an exhaust gas by bringing the exhaust gas under an oxygen rich atmosphere into contact with the above-mentioned catalyst.

5955395

PREPARATION AND USE OF Pt/ZEOILITE CATALYST MATERIALS FOR REMOVING CARBON MONOXIDE

Andorf, Renato; Maunz, Werner; Plog, Carsten; Stengel, Thomas; Meckenbeuren, Markdorf, Friedrichshafen, GERMANY assigned to Mercedes-Benz AG

The invention relates to a process for preparing a Pt/zeolite catalyst material, the material itself, and the use of the material in removing carbon monoxide from a gas. In a preferred embodiment, the invention relates to a process for preparing a Pt/zeolite catalyst material for the catalytic removal of CO in H₂-rich gas by means of selective CO oxidation and the use of such a catalyst material. The catalyst materials of the invention can be prepared by employing Pt(NH₃)₄Cl₂H₂O and a zeolite material. The resulting material can be used for the catalytic removal of CO from an H₂-rich outlet gas mixture from a methanol reforming reactor. The compositions and methods to produce catalytic materials result in products with high and prolonged catalyst activity. In particular, the methods and compositions of the invention can be used in removing CO from the hydrogen fed to fuel cells in electric vehicles having stored methanol fuel.

5972821

CATALYSTS FOR CLEANING EXHAUST GASES

Nojima, Shigeru; Iida, Kouzo; Hiroshima, JAPAN assigned to Mitsubishi Jukogyo Kabushiki Kaisha

A catalyst for cleaning exhaust gases has a first catalyst layer having as an active metal on an elemental support at least one noble metal selected from the group consisting of platinum, rhodium and palladium and a second catalyst layer having iridium as an active metal which is provided as a overlayer on the first catalyst layer.

5972828

METHOD OF MANUFACTURING CATALYST FOR CLEANING EXHAUST GAS RELEASED FROM INTERNAL COMBUSTION ENGINE, AND CATALYST FOR THE SAME

Doi, Ryouta; Iizuka, Hidehiro; Hanaoka, Hiroshi; Ogawa, Toshio; Kuroda, Osamu; Yamashita, Hisao; Kitahara, Yuichi; Hiratsuka, Toshifumi; Naka-machi, Hitachinaka, Kodaira, Takahagi, Hitachi, JAPAN assigned to Hitachi Ltd

In order to remove nitrogen oxide in an exhaust gas released from a lean burn engine, a catalyst: supporting an rare earth metal, an alkali earth metal, titanium, a noble metal, and magnesium on the surface of a porous carrier made of inorganic oxides is provided. In order to manufacture the catalyst, the rare earth metal is supported onto the surface of the carrier first, subsequently the alkali earth metal other than magnesium and titanium are supported, the noble metal is supported, and magnesium is supported finally onto the surface of the carrier. The catalyst of the present invention is scarcely poisoned by SO_x in the exhaust gas released from the lean burn engine, and has a heat resistivity durable against high speed driving.

5976476

CATALYTIC COMPOSITION COMPRISING A MIXTURE OF CERIUM OXIDE WITH MANGANESE, IRON OR PRASEODYMIUM OXIDE, PROCESS FOR ITS PREPARATION AND ITS USE IN AUTOMOBILE AFTERBURNING CATALYSIS

Blanchard, Gilbert; Quemere, Eric; Touret, Olivier; Visciglio, Valerie; Lagny-Le-Sec, Cormeilles-En-Parisis, La Rochelle, Paris, FRANCE assigned to Rhodia Chimie

The invention provides a catalytic composition which is based on a cerium oxide and on at least one other oxide chosen from iron, manganese and praseodymium oxides, which controls H₂S emissions in the catalysis of treatment of automobile exhaust gas.

**JOURNAL OF MOLECULAR CATALYSIS A:
CHEMICAL - CATALYSIS FOR BULK AND FINE
CHEMICALS**

5935896

**CATALYST SUPPORTS AND CATALYSTS FOR
DEHYDROCYANATION REACTIONS AND PRO-
CESSES FOR PRODUCING THEM**

Dupuis, Jacques; Trubenbach, Peter; Schwab, Ekkehard; Kroner, Michael; Ludwigshafen, Neustadt, Bergholz-Rehbrücke, GERMANY assigned to BASF Aktiengesellschaft

An SiO₂-free, alphaAl₂O₃-containing catalyst support in the form of a hollow body in which at least part of the outer walls of the hollow body is open can be used to produce a catalyst for dehydrocyanation reactions.

5945570

**CATALYST AND PROCESS FOR PREPARING
1,3-PROPANEDIOL**

Arhancet, Juan Pedro; Himelfarb, Paul; Powell, Joseph Broun; Plundo, Robert Alfred; Kazi, Mohammed Shahjahan; Carrick, William Joseph; Katy, Houston, Twinsburg, Chardon, OH, UNITED STATES

A solid, particulate catalyst composition is provided containing an active nickel component in which the nickel constitutes from about 25 to about 60 wt % of the catalyst composition; a molybdenum component in which the molybdenum constitutes from about 5 to about 20 wt.% of the catalyst composition; and a binder component comprising at least one of oxides of silica, zirconium, aluminum, zinc and calcium, each of the calcium, aluminum and zinc being present in an amount no greater than about 2 wt.%, preferably about 0 to 1 wt.%. The catalyst is designed for the selective hydrogenation of 3-hydroxypropanal to 1,3-propanediol in aqueous solution.

5948382

**SELECTIVE OXIDATION OF HYDROGEN SUL-
FIDE IN THE PRESENCE OF MIXED-OXIDE
CATALYST CONTAINING IRON, MOLYBDE-
NUM AND ANTIMONY**

Li, Kuo-Tseng; Huang, Chun-Hsiung; Taichung, TAIWAN assigned to National Science Council

The present invention discloses a method of selectively oxidizing hydrogen sulfide to elemental sulfur, in which a H₂S-containing gas mixture contacts with an oxygen-containing gas at about 50°C–400°C in the presence of a mixed-oxide catalyst. The reaction product mixture contains substantially no sulfur dioxide. The mixed-oxide catalyst, in addition to iron (III) and molybdate (VI) components, further contains an antimony component as a promoter.

5948683

**CATALYST FOR SELECTIVE OXIDATION OF
UNSATURATED HYDROCARBONS AND METH-
ODS OF MAKING AND USING THE SAME**

Koermer, Gerald S; Moini, Ahmad; Roseland, Princeton, NJ, UNITED STATES assigned to Engelhard Corporation

A selective catalytic material is used to catalyze selective oxidation of unsaturated hydrocarbons, e.g., olefins, in the presence of carbon monoxide. The catalytic material comprises phosphated ceria containing from 0.1 to 20, preferably from 1 to 5, percent by weight phosphate component (calculated as elemental phosphorus). The phosphated ceria may be made by mixing particles of ceria and a solution containing phosphates to disperse the desired amount of phosphate component on the ceria and calcining the particles after separation of them from the solution. The resulting selective catalytic material is contacted under oxidizing conditions with a gas stream containing an oxidant, e.g., air, carbon monoxide and one or more unsaturated hydrocarbons. The selective catalytic material may be disposed on a sensor disposed within a conduit downstream of a conventional treatment catalyst to evaluate the performance of the latter by measuring the extent of unsaturated hydrocarbon oxidation catalyzed by the selective catalytic material in the treated gas.

5948724**VINYL ACETATE CATALYST COMPRISING METALLIC PALLADIUM AND GOLD AND CUPRIC ACETATE**

Nicolau, Ioan; Broussard, Jerry A; Colling, Philip M; Corpus Christi, TX, UNITED STATES assigned to Celanese International Corporation

A catalyst for the production of vinyl acetate by reaction of ethylene, oxygen and acetic acid comprising a porous support on the porous surfaces of which is deposited catalytically effective amounts of metallic palladium and gold, and cupric acetate. Use of this catalyst results in a reaction having a relatively low selectivity to carbon dioxide.

5948942**BIMETALLIC CATALYST FOR THE SIMULTANEOUS SELECTIVE HYDROGENATION OF DIOLEFINS AND NITRILES AND METHOD OF MAKING THE SAME**

Ramirez de Agudelo, Magdalena; Djauadi, Djamel; Guerra, Julia; Miranda, La Morita Res. Sierra, San Antonio, VENEZUELA assigned to Intevp S.A.

A catalyst useful for the simultaneous and selective hydrogenation of diolefins and nitriles present in a hydrocarbon feedstock includes (a) a support material selected from the group consisting of inorganic oxide, carbon, zeolite and mixtures thereof; and (b) a catalytically active metal phase including at least two metals selected from the group consisting of at least partially reduced Group IB metals and completely reduced Group VIII metals, the active metal phase being present in an amount of about greater than or equal to 0.03 wt.%.

5955609**TRIMER CATALYST SYSTEM FOR ALIPHATIC AND AROMATIC ISOCYANATES**

Slack, William E; Kemp, II, Hersel T; Moundsville, New Martinsville, WV, UNITED STATES assigned to Bayer Corporation

This invention relates to a novel trimerization catalyst system, and to a process for trimerizing organic polyisocyanates in the presence of thermally active catalyst systems. These catalyst systems comprise (A) compounds selected from the group consisting of (i) lithium salts of aliphatic or aromatic carboxylic acids,

(ii) lithium salts of hydroxyl group containing compounds wherein the hydroxyl groups are directed attached to an aromatic ring, and (iii) lithium hydroxide; (B) an allophanate catalyst; and (C) an organic compound which contains at least one hydroxyl group.

5972824**CATALYST, PROCESS FOR PRODUCING THE CATALYST AND PROCESS FOR PREPARING VINYL ACETATE USING THE CATALYST**

Herzog, Bernhard; Stein, Roswitha; Renkel, Karl-Heinz; Oberhausen, Duisburg, Oberhausen, GERMANY assigned to Celanese GmbH

A process for the production of a catalyst for preparing vinyl acetate in the gas phase from ethylene, acetic acid and oxygen or oxygen-containing gases which catalyst comprises palladium and/or its compounds, gold and/or its compounds and also alkali metal compounds on a particulate, porous support obtained by (a) impregnating the support with soluble palladium and gold compounds, (b) converting the soluble palladium and gold compounds into insoluble palladium and gold compounds by addition of an alkaline solution to the support, (c) reducing the insoluble palladium and gold compounds on the support with a reducing agent in the liquid or gaseous phase, (d) impregnating the support with at least one soluble alkali metal compound and (e) finally drying the support at a maximum of 150°C, wherein the catalyst is brought into contact with at least one peroxidic compound in step (b).

5972827**CATALYTIC OXYCHLORINATION OF HYDROCARBONS TO PRODUCE CHLOROCARBONS**

Petit, Alain; Bachelard, Roland; Clair, Rene; Correia, Yves; Martigues, Lyons, Martigues, Chateau-Arnoux, FRANCE assigned to Atochem

Hydrocarbons, e.g., ethylene, are steady-state catalytically oxychlorinated into chlorocarbons, e.g., 1,2-dichloroethane, by fluidizing a fluidizable charge by directing a gaseous feedstream containing a hydrocarbon therethrough and therein oxychlorinating such hydrocarbon, the gaseous feedstream further comprising an oxygen-containing gas and gaseous hydrochloric acid and the fluidizable charge comprising immixture of a catalytically effective amount of an oxychlorination catalyst and particles of a catalytically and chemically

inert solid substance, and which further comprises introducing a solution or suspension of a catalytically active copper compound into such fluidized charge during the oxychlorination reaction.

5973193**ETHYL ACETATE SYNTHESIS FROM ETHYLENE AND ACETIC ACID USING SOLID ACID CATALYSTS**

Crane, Robert A; Brown, Stephen H; De Caul, Lorenzo; Monroeville, Princeton, Wilmington, DE, UNITED STATES assigned to Mobil Oil Corporation

A method of producing ethyl acetate by reacting acetic acid with ethylene in the presence of a solid acidic catalyst comprising a zeolite selected from the group consisting of MCM-22, MCM-49, MCM-56, ZSM-5 and zeolite-Beta.

5976486**METHOD FOR CATALYTIC PRODUCTION OF HYDROGEN PEROXIDE AND CATALYST THEREOF**

Thompson, Mark E; Krishnan, Venkatesan V; Dokoutchaev, Alexandre G; Abdel-Razzaq, Feras; Rice, Shannon C; Los Angeles, CA, UNITED STATES assigned to University of Southern California

A method for the production of hydrogen peroxide from a source of hydrogen and oxygen in the presence of a dispersion of a catalyst in an organic reaction medium, the catalyst being composed of inert particles of between 1 and 100 μm , the particles having coated thereon about three to 10 layers of a zirconium or hafnium complex, the organic reaction medium having a pH of less than about 3 and composed of at least 50% of a lower alkyl alcohol, a lower alkyl ketone or a mixture thereof, water and a mineral acid.

5977290**BASIC CATALYSTS FOR THE ALDOL REACTION**

Siebenhaar, Bernd; Kandern, GERMANY assigned to Novartis AG

The invention relates to a process for the condensation of aldehydes or ketones with C-H acidic compounds (in particular Knoevenagel reaction) in the presence of at least one molecular sieve in the form of a

zeolite or sheet silicate and one alkali carbonate, alkaline earth carbonate or ammonium carbonate as catalyst system. The products obtained are important intermediates or end products for the perfume industry.

5977422**ORGANOALUMINUM CATALYSIS OF ALKYLATION REACTIONS**

Costello, Steven A; Potts, Douglas L; Pogue, Randall F; Lake Jackson, Angleton, Friendswood, TX, UNITED STATES assigned to The Dow Chemical Company

This invention relates to an improved catalytic process for the alkylation of benzene or substituted benzene with alkyl halides for the continuous production of diarylalkanes or substituted derivatives thereof using ethylaluminum dichloride or methylaluminum dichloride as an organoaluminum dichloride catalyst. A process and apparatus are provided for reacting either benzene (or a substituted benzene compound) together with either an alkyl halide or an aromatic halide.

5981804**CATALYST FOR PRODUCTION OF UNSATURATED ALDEHYDE AND UNSATURATED CARBOXYLIC ACID AND METHOD FOR PRODUCTION OF UNSATURATED ALDEHYDE AND UNSATURATED CARBOXYLIC ACID BY USE OF THE CATALYST**

Kurimoto, Ikuo; Kawajiri, Tatsuya; Onodera, Hideo; Tanimoto, Michio; Aoki, Yukio; Hyogo, JAPAN assigned to Nippon Shokubai Company Ltd

A catalyst for the production of unsaturated aldehyde and unsaturated carboxylic acid by the vapor-phase catalytic oxidation of at least one compound selected from the group consisting of propylene, isobutylene, *t*-butanol and methyl-*t*-butyl ether and a method for the production of unsaturated aldehyde and unsaturated carboxylic acid by the use of this catalyst are provided. The catalyst of this invention comprises (A) a catalyst having Mo, Bi and Fe as essential components and used for the production of unsaturated aldehyde and unsaturated carboxylic acid by vapor-phase catalytic oxidation of propylene, isobutylene, *t*-butanol and/or methyl-*t*-butyl ether and (B) a solid acid having acid strength (Ho) of not more than -11.93 . Since this catalyst excels in catalytic activity and service life, it allows unsaturated aldehyde and unsaturated carboxylic acid to be produced stably at a high yield for a long time.

5981808**COBALT-CATALYZED PROCESS FOR PREPARING 1, 3-PROPANEDIOL FROM ETHYLENE OXIDE**

Powell, Joseph Broun; Slaugh, Lynn Henry; Eubanks, David Cleve; Mullin, Stephan Blake; Thomason, Terry Blain; Weider, Paul Richard; Semple, Thomas Carl; Houston, Katy, Friendswood, TX, UNITED STATES assigned to Shell Oil Company

1,3-Propanediol is prepared in a process that involves reacting ethylene oxide with carbon monoxide and hydrogen in an essentially non-water-miscible solvent in the presence of a non-phosphine-ligated cobalt catalyst and a catalyst promoter to produce an intermediate product mixture containing 3-hydroxypropanal in an amount less than 15 wt.%; extracting the 3-hydroxypropanal from the intermediate product mixture into an aqueous liquid at a temperature less than about 100°C and separating the aqueous phase containing 3-hydroxypropanal from the organic phase containing cobalt catalyst; hydrogenating the 3-hydroxypropanal in the aqueous phase to 1,3-propanediol; and recovering the 1,3-propanediol. The process enables the production of 1,3-propanediol in high yield and selectivity without the use of a phosphine ligand-modified cobalt catalyst.

JOURNAL OF MOLECULAR CATALYSIS A: CHEMICAL-POLYMERISATION CATALYSIS**5942462****PROCESS FOR PREPARING GROUP 6 METAL-BASED OLEFIN POLYMERIZATION CATALYST COMPONENT**

Mitchell, Jonathan P; Villafane, Michael E; Hastings on Hudson, White Plains, NY, UNITED STATES assigned to Akzo Nobel N.V.

A Group 6 metal-containing, ligand-containing olefin polymerization catalyst component can be made by using an unsolvated Group 6 metal trihalide as the starting reagent for the Group 6 metal which comprises contacting (e.g., in tetrahydrofuran) the Group VIB metal trihalide, such as chromium trichloride, with a ligand reagent or reagents, such as a cyclopentadienyl-containing lithium compound and a lower alkyl-containing lithium compound, in the presence of a sigma donor ligand, such as pyridine.

5942568**POLYOXYMETHYLENE WITH POLYOLEFIN PREPARED FROM SINGLE SITE CATALYST**

Niino, Masahiko; Ibe, Sadao; Kurashiki, Tokyo, JAPAN assigned to Asahi Kasei Kogyo Kabushiki Kaisha

Polyoxymethylene resin composition comprising (A) 50 to 99.9 parts by weight of a polyoxymethylene resin and (B) 0.1 to 50 parts by weight of a polyolefin resin, containing 30% to 100% by weight of an ethylene unit based on the whole amount of the polyolefin resin, prepared by using a single site catalyst. The present invention provides a polyoxymethylene resin composition, which possess excellent lower friction characteristics and wear resistance at temperature over 60°C.

5942586**CATALYST FOR THE POLYMERIZATION OF OLEFINS, PROCESS FOR ITS PREPARATION AND ITS USE**

Herrmann, Hans-Friedrich; Bachmann, Bernd; Hierholzer, Bernhard; Spaleck, Walter; Darmstadt, Epstein/Taunus, Frankfurt am Main, Liederbach/Taunus, GERMANY assigned to Targor GmbH

Catalyst for the polymerization of olefins, process for its preparation, and its use. The present invention relates to a supported catalyst for the polymerization of olefins, which can be prepared by reacting the reaction product formed from an aluminoxane and at least one metallocene with a microporous, polymeric support.

5948720**CATALYST FOR THE PRODUCTION OF FLEXIBLE POLYOLEFIN COMPOSITIONS, METHODS FOR MAKING AND USING SAME, AND PRODUCTS THEREOF**

Sun, Lixin; Allen, George C; Hughes, Michael P; Odessa, TX, UNITED STATES assigned to Huntsman Polymers Corporation

A catalyst for use in the production of flexible polyolefins using a pro-catalyst of (a) a magnesium halide, (b) an aluminum halide, (c) a tetravalent titanium halide, (d) an electron donor comprising at least one of 2,6-lutidine, 6-chloro-2-picoline, or 2,6-dichloropyridine; and (e) a silane having the formula $R_1R_2Si(OR_3)(OR_4)$, wherein R_1 and R_2 are each an

H, C₁₋₆ alkyl, C₁₋₆ aryl, C₅₋₁₂ cycloalkane, each of which may be unsubstituted, mono- or di-substituted, and R₃ and R₄ are H, C₁₋₆ alkane, or a mono- or di-substituted C₁₋₆ alkane, and a co-catalyst of an organometallic compound, as well as an optional external modifier that may be combined to form a catalyst. Methods for preparing the catalyst, for using the same to produce flexible polyolefin compositions having reduced stickiness and tacticity, and the flexible polyolefin compositions produced thereby are also part of the invention. The flexible polyolefin compositions are high-molecular weight average, predominantly atactic flexible polyolefin polymers having a heat of fusion of about to 60 J/g, a polydispersity of less than about 10, a melt flow rate of between about 0.3 g/10 min to 15 g/10 min, and a reduced stickiness.

5948869

PROCESS FOR THE PREPARATION OF A CATALYST USEFUL FOR THE HYDROGENATION OF STYRENE-BUTADIENE COPOLYMERS

Vallieri, Andrea; Cavallo, Claudio; Viola, Gian Tommaso; Comacchio, Forli, Cervia-Ravenna, ITALY assigned to Enichem S.p.A.

Catalytic composition effective in the selective hydrogenation of olefinic double bonds prepared by the reaction between: (A) at least one bis(cyclopentadienyl)titanium derivative having the general formula (I) (C₅H₅)₂Ti(R) (R₁) wherein R and R₁, the same or different, are halogens; the above compound (I) being solid or dispersed in one or more non-solvent diluents; (B) at least one organo derivative having general formula (II) M(R₂) (R₃) wherein M is selected from zinc and magnesium, and R₂ and R₃, the same or different, are selected from C₁-C₁₆ alkyls; (C) at least one modifier.

5948871

METHOD FOR FEEDING A LIQUID CATALYST TO A FLUIDIZED BED POLYMERIZATION REACTOR

Goode, Mark Gregory; Williams, Clark Curtis; Hurricane, Charleston, WV, UNITED STATES assigned to Union Carbide Chemicals and Plastics Technology Corporation

For gas phase polymerization reactions in the presence of an unsupported polymerization catalyst, there is

provided a process for introducing a liquid catalyst so as to provide a resin particle lean zone such that the average particle size of the resin produced ranges from about 0.01 to about 0.06 in.

5952457

POLYMERIZATION CATALYST FOR ALKYLENE OXIDE COMPOUND AND PRODUCTION PROCESS OF POLY(ALKYLENE OXIDE)

Kouno, Masahiro; Nobori, Tadahito; Mizutani, Kazumi; Takaki, Usaji; Kanagawa-ken, Yokohama, Fujisawa, JAPAN assigned to Mitsui Chemicals, Inc

A catalyst for the polymerization of an alkylene oxide compound is disclosed. This catalyst is composed of a phosphazene compound or a phosphazanium salt, which is derived from the phosphazene compound and an active hydrogen compound. A poly(alkylene oxide) can be efficiently produced by polymerizing the alkylene oxide compound in the presence of the catalyst and, when the catalyst is composed of the phosphazene compound, the active hydrogen compound. The poly(alkylene oxide) contains no metal component and, compared with those produced using conventional amine-base catalysts, has also been improved significantly in odor.

5955396

MORPHOLOGY-CONTROLLED OLEFIN POLYMERIZATION CATALYST FORMED FROM AN EMULSION

Lee, Sam S; Trost, Mary K; Cohen, Steven A; Cumming, Alpharetta, GA, UNITED STATES assigned to BP Amoco Corporation

A solid, hydrocarbon-insoluble, olefin-polymerization catalyst component having substantially uniform particles useful in polymerizing olefins is formed by: reacting a magnesium-containing compound with carbon dioxide or sulfur dioxide; forming a two-phase mixture of the resulting magnesium-containing compound with a suitable liquid hydrocarbon-miscible phase and a suitable polar solvent phase; forming particles by adding the two-phase mixture after vigorous agitation to a liquid hydrocarbon; and contacting the formed particles at least once with a transition metal halide in the presence of an electron donor.

5972822

BISCYCLOPENTADIENYLDIENE COMPLEX CONTAINING ADDITION POLYMERIZATION CATALYSTS

Timmers, Francis J; Devore, David D; Stevens, James C; Midland, Richmond, TX, UNITED STATES assigned to The Dow Chemical Company

Catalysts for polymerizing olefins, diolefins and/or acetylenically unsaturated monomers comprising biscyclopentadienyl, Group 4 transition metal complexes formed with conjugated dienes wherein the diene is bound to the transition metal either in the form of a σ -complex or a π -complex in combination with a cocatalyst or subjected to bulk electrolysis in the presence of compatible, inert non-coordinating anions.

5973088

CATIONIC ALUMINUM ALKYL COMPLEXES INCORPORATING AMIDINATE LIGANDS AS POLYMERIZATION CATALYSTS

Jordan, Richard F; Coles, Martyn P; Iowa City, IA, UNITED STATES assigned to University of Iowa Research Foundation

Non-transition metal containing Ziegler–Natta-like catalysts are prepared and used for polymerization reactions. The catalysts are cationic aluminum amidinate compounds. The compounds successfully catalyze polymerization of unsaturated hydrocarbons such as alpha olefins and avoid the expense of transition metals and, as well, the environmental objections to the use of the same.

5977392

ORGANOMETALLIC CATALYSTS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF ALPHA-OLEFINS

Royo, Jose Sancho; Lafuente, Antonio Munoz-Escalona; Garcia, Begona Pena; Marcos, Carlos Martin; Madrid, SPAIN assigned to Respol Quimica S.A.

Catalyst [Figure] wherein: M is a transition metal of groups 3, 4–10, lanthanide or actinide of the periodic table of the elements; A is a ring with delocalized π electrons, L is a neutral Lewis base; m is an integer whose value can be: 0 or 1; E is selected from the group comprising: BR^{II} , CR_2^{II} , SiR_2^{II} , GeR_2^{II} ; Hal is

selected from the group comprising iodine, bromine or chlorine; R^{III} has the same meaning of R^{II} ; Si is a silicon atom; D is selected from the group comprising: O, S, NR^{IV} , PR^{IV} , OR^{IV} , SR^{IV} , NR_2^{IV} , PR_2^{IV} ; each X group equal to or different from each other is selected from the group comprising hydrogen, halide, alkyl, cycloalkyl, aryl, alkenyl, arylallyl, arylalkenyl or alkylaryl with 1 to 20 carbon atoms, n is a number whose value can be: 0, 1, 2 or 3, in order to fill the remaining valences of metal M. It is also described as a method for supporting the compound of formula I.

5986024

PREPARATION OF MULTIMODAL POLYMER COMPOSITIONS USING MULTINUCLEAR METALLOCENE CATALYSTS

Wilson, Jr, Robert B; Palo Alto, CA, UNITED STATES assigned to SRI International

A process is provided for preparing polymer compositions, which are multimodal in nature. The process involves contacting, under polymerization conditions, a selected addition polymerizable monomer with a metallocene catalyst having two or more distinct and chemically different active sites, and a catalyst activator.

5990254

METALLOCENES AS CATALYSTS IN THE PREPARATION OF CYCLOOLEFIN COPOLYMERS

Weller, Thomas; Aulbach, Michael; Kuber, Frank; Erker, Gerhard; Psiorz, Christian; Bachmann, Bernd; Osan, Frank; Mainz, Hofheim, Oberursel, Munster, Eppstein, Kelkheim, GERMANY assigned to Targor GmbH

The present invention relates to a stereorigid metallocene compound containing, as ligands, at least two substituted or unsubstituted cyclopentadienyl groups, which are bonded to one another via a monocyclic or polycyclic ring system, where at least one cyclopentadienyl group is fused to the monocyclic or polycyclic ring system, and to a process for the preparation of a cycloolefin copolymer. The cycloolefin copolymers obtained in this way have high tear strengths and are suitable for the production of extrusion parts and injection moldings.

5990255**HIGH MOLECULAR WEIGHT POLYSYTRENE
PRODUCTION BY VINYL ACID CATALYZED
FREE RADICAL POLYMERIZATION**

Priddy, Duane B; Dais, Virginia A; Midland, Sanford,
MI, UNITED STATES assigned to The Dow Chemical
Company

The present invention is a free radical bulk polymerization process for the preparation of high molecular weight polymers from vinyl aromatic monomers, characterized in that the polymerization is conducted in the presence of a vinyl acid containing either a sulfur or phosphorus atom within the acid functional group.