of radicals in these systems, and give data on the yield of radicals (G_R) for various percentages of coverage of the zeolite surface. It is shown that radical accumulation in these systems proceeds somewhat differently than during irradiation of free water or methanol at 77°K.

Further, the authors studied the behavior of the radicals when the temperature was raised above 77°K, and found that their stability depends on the structure of the zeolite and the mobility of the adsorbed molecules. The $\dot{O}H$ and $\dot{C}H_2OH$ species recombine via a stepwise mechanism. The annihilation of the $\dot{H}$ radicals is a bimolecular process whose $k_H = 4.2 \times 10^{-16}$ Exp $- [(4600 \pm 800)/RT]$ cm^3/sec.

Thermal Decomposition of Silver Permanganate in the Presence of Metal Oxides

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The authors decomposed silver permanganate at 115°C and showed that ZnO and ThO_2 promote the reaction, that Co_3O_4 and NiO are inert, and that TiO_2 inhibits the process (as do the products of degradation of the silver permanganate itself). The results are explained by assuming an electron exchange between the reactant and the oxide via a layer of reaction product.

The authors have found that $\varphi_1 > \varphi_2 \leqslant \varphi_3$ in the system ZnO–decomposition product–$AgMnO_4$, and that the electrons are transferred from the decomposition product to ZnO and $AgMnO_4$.

An Explanation of the "Distribution Function" in the Theory of Adsorption on Nonuniform Surfaces

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The authors discuss a semiconductor doped with an impurity which does not directly participate in chemisorption, and which is nonuniformly distributed throughout the matrix or on the surface of the semiconductor. It is shown that in this case the Fermi level in the forbidden zone between the energy bands (and, consequently, the chemisorptive properties of the surface) vary in the different areas of the surface. Under these conditions, the surface exhibits unequal heats of adsorption from point to point. The pattern of this nonuniformity depends on the distribution pattern of the impurity. There exists a relationship between the concentration gradient of the impurity and the "distribution function" of the heats of adsorption.

Liquid-Phase Oxidation of Hydrocarbons over Solid Catalysts. I. Paraffins and Cycloparaffins

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Both metals and metal oxides catalyze the partial liquid-phase oxidation of paraffins, aromatics, and cycloparaffins. The activity of oxides is promoted by additives. The authors postulate a heterogeneous-homogeneous mechanism. They also report a new method for control of liquid-phase oxidation (by proper combination of solid catalysts and inhibitors).

Selective Hydrogenation of Crotonaldehyde (to Butyraldehyde)

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Crotonaldehyde was hydrogenated at 100°–180°C at various H_2:C_3H_5CHO ratios and space velocities ranging from 0.2 to 2.2 hr^{-1}. The selectivity with which butyraldehyde is produced is $S_{overall} = 190.2 + 40\,V - 0.73\,T - 46/x$. The optimum industrial conditions are 150°C, $V = 1$–1.5 hr^{-1}, and a C_3H_5CHO:H_2 ratio of 1.

Shift of the Catalyst Potential as a Function of the Rate of Liquid-Phase Hydrogenation. IV. Comparison of Activities of Raney Nickel, and Platinum and Palladium Blacks

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The activities of Raney nickel, and platinum and palladium blacks in liquid-phase hydrogenation were compared in terms of productivity per unit active surface (as referred to hydrogen) and in terms of active surfaces. The productivity factor is specific to each catalyst (and, all other conditions being equal, is determined by the nature of that catalyst).

Activity of Platinum Catalysts. V. Effect of KOH on the Activity of Platinized Carbon

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Catalysts produced by reduction of H_2PtCl_6 with aqueous formaldehyde and KOH (the Zelinsky method) are more active in C_5 dehydro-