

**Kinetics of Hydrochlorination of Acetylene Over Aluminum Oxide**

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Various mechanisms of heterogeneous catalytic reactions of the type  $A_1 + A_2 \rightleftharpoons A_3$  were investigated at continuous flow conditions. The cases covered were: (1) Interaction between adsorbed molecules of compounds  $A_1$  and  $A_2$ ; (2) Interaction between adsorbed molecules of one compound with the molecules of the other one in the gaseous phase; and (3) Reactions whose rates depend on the rate of adsorption of one of the reactants.

Applicability of the kinetic equations, which were derived, to the hydrochlorination of acetylene over aluminum oxide is discussed. Show that these equations are in good agreement with the experimental data for the first and third cases.

**Investigation of Acidity of Surface Hydroxyl Groups of Various Oxide Catalysts with the Aid of Infra-Red Spectroscopy**

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An infra-red analytical technique was employed to characterize the acidity of the hydroxyl groups of various oxide catalysts in a study of (acid-base) interaction between them and various basic molecules. For each catalyst, the frequency of shift in the O—H oscillation depends upon the strength of the base used.

**Effect of Longitudinal Diffusion in Cylindrical Reactors Upon Product Distribution in Continuous Zero-Order Reactions**

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A study of the effect of diffusion in cylindrical reactors upon product concentration was carried out in continuous operation using zero-order reaction feeds. Suggest parameters to characterize the diffusion processes at the conditions used and propose experimental models to determine these parameters.