dependence is clearly demonstrated during the induction period, in the course of which the rate of polymerization increases from zero to a fixed value.

After a period of polymerization at a constant rate, the rate decreases. Below a certain minimum concentration of the catalyst, the polymerization reaction does not occur. The results show that at fixed system pressures of 3–40 atm (abs), the polymerization rate varies very nearly as the square of the ethylene partial pressure.

The experimental information shows that accurate picture of the kinetics of ethylene polymerization over the chromium oxide catalyst can be obtained only by taking into account the effect of different additives in the reaction system.

Chemisorption of Hydrogen by γ-Al_2O_3

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A reaction mechanism is proposed which is based on the experimental data of the kinetics of chemisorption of hydrogen by γ-Al_2O_3. This assumes that surface migration of atomic hydrogen from the active centers of one type to those of another type is the reaction limiting step.

Structure of Silica-Titania Catalysts

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Binary $SiO_2 \cdot TiO_2$ catalysts form a specific amorphous (X-ray analysis) silicate structure, with the atoms of titanium being present in the lowered (quaternary) coordination relative to the oxygen. Replacement of silicon in the silicate structure by titanium atoms is accompanied by depolarization of the silicate skeleton. Formation of the specific silica-titania structure occurs in the source of preparation of the catalyst. In silica-titania catalyst, the strongly-bound water is primarily attached to the surface atoms of the silicon.

Mathematical Model and Kinetics of Polymerization of Ethylene in Presence of Suspended Chromium Oxide Catalyst

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A mathematical model is described for polymerization of ethylene over a chromium oxide catalyst in suspension. The model was designed with the aid of Analogue Computer MN-14. The mathematical description of the process elucidates the experimentally-determined kinetic correlations.

Kinetics Scheme to Optimize Ethylene Yields in Pyrolysis of Ethane

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A kinetic scheme was constructed to optimize yields of ethylene in high-temperature pyrolysis of ethane. The scheme is based on the results of a detailed study, utilizing tagged atoms in the experimental determination of the kinetics and products formation mechanism in a high temperature (800°–900°) decomposition of ethane.

Thermometric Study of Kinetics of Reactions in Liquid Phase

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An apparatus is described for thermometric determination of the reaction rates in exothermal and endothermal reactions in liquid phase. The method used is based on quantitatively measuring the heat losses. The equipment is useful in studying reactions of 3 minutes to 5 hours duration and the average rate of heat release of not less than 7–10 kcal/hr. The method and equipment were proven in polycondensation of terephthalyl chloride with ethylene glycol, using dioxane as the solvent. The thermal effect of the reaction, Q, is 14.2 kcal/mol and the reaction constant, k, at a temperature of 65° is 4.1×10^{-4} l/mol-sec.

BRIEF COMMUNICATIONS:

Initiation Mechanism in Thermal Decomposition of Ethane

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The results of theoretical calculations of the variation of constants, k_0 and k_1, with pressure are compared with published experimental data for thermal decomposition of ethane. The calculated constants satisfactorily agree with those based on the experimental results.