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Chemical Relaxation in a Spent Combustible Gas

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Composition analyses of the gases from combustion of air-methane mixtures show that chemical relaxation in these waste gases follows a well-defined mechanism, in which homogeneous recombination of the radicals formed in the flame exerts the predominant role. In the completely oxidized zone of the flame the concentrations of the OH and CH_3 radicals and of the H atoms are in balance. The upper limit of concentration of atomic oxygen in the flame was evaluated.

Nature of Molecular "Pictures" on an Electron Gun Screen

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A theoretical interpretation is given to explain the shape of the emission "pictures" produced on an electron gun screen in adsorption of gases and vapors. For linear molecules oriented along the field force lines, the problem is examined from the standpoint of quantum mechanics. The causes of stability of the molecular pictures are listed. Possible mechanisms are examined to explain the pictorial intertransformations due to the field alteration in the vicinity of the molecules. Behavior of the electron cloud outside the limits of each molecule was investigated.

Inhibition of Paraffin Cracking in Gaseous Phase

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The mechanism of completely homogeneous cracking of paraffins, which is described in a series of articles by Leiden and Voytzekhovsky, is examined critically. This mechanism is shown to be a variant of the earlier-published concept of occurrence—parallel to cracking—of "reversible" and "irreversible" chain generating reactions. Leiden *et al.* assert that heterogeneous generation of the chain reactions via the two mechanisms is not possible. This assertion does not appear to be well-substantiated.

Catalyst Interaction with Reaction Mixtures in Catalysis

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A study was made of specific properties of heterogeneous catalytic reactions which have a common stage (e.g. chemisorption) with a concurrent catalyst-reactants interaction. The heterogeneous reactions were found to exert a controlling effect on the catalyst transformations. Certain novel relationships are described for the specific reaction systems studied. In part, this study shows that kinetics of the catalytic reactions and activity of the catalysts used are functions of the true kinetics of the catalyzed reactions and of the rates of catalyst interaction with the components of reacting mixtures.

X-Ray K-Series Spectra for Copper Absorbed by Some Catalytically-Active Intra-Complexed Polymers

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A comprehensive experimental study was made of the structure of the K-spectra for copper absorbed by the (SS type) Cu polychelates with different radicals in the principal chain of their organic moieties. The results show that the basic structure of the K-adsorption spectra depends on the type of the radical in the main chain. This