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Free Radical Recombination Processes on Semi-Conductor Surfaces and Their Role in Luminescence

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The mechanism of luminescence in luminofors was studied as possibly occurring by the radical recombination route under the influence of chemically active gases and by "cando"-luminescence. The intensity of the radical-recombination luminescence was calculated in terms of pressure and the levels of Fermi state. The effect of an outside electric field on the intensity of "cando"-luminescence was determined experimentally. The results qualitatively agree with the theory proposed.

Possible Explanation of the Compensating Effect in Some Chemical Reactions

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The compensating effect can be rationalized by assuming that (1) the experimentally-determined effective rate of a reaction studied is the sum of the local rates which are independent of each other and (2) the free activation energies follow the Gaussian frequency distribution.

Decomposition of Molecular Ions Formed in Photoionization of Hydrazine and of Some of Its Alkyl Derivatives

By M. E. AKOPYAN AND F. I. VEELESOV

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Summarizes the results of studies of the mass spectra and of the ion formation potentials in photoionization of hydrazine; methyl hydrazine; 1,1-dimethyl hydrazine; and 1-methyl 1-normal butyl hydrazine. Gives calculated values of heats of formation of the ions, ionization potentials of the radicals, and dissociation energies of some of the bonds.

Formation of Free Radicals in the RH + O_2 System: I. Tetralin, Cyclohexanol, Cyclohexanone

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The mechanism of free radical formation (chain initiation) in an RH + O_2 liquid phase system was studied by use of an inhibition technique. Based on the results for tetralin and cyclohexanol, show that the radicals are formed according to the reaction, $2RH + O_2 \rightarrow 2R\cdot + H_2O_2$. List values of the reaction rate constants for tetralin, cyclohexanol and cyclohexanone.

Determination of Absolute Rates of Chain Initiation and Growth in Anionic Polymerization of Styrene

By H. S. BAGDASARYAN AND N. I. NIEPOMNYASHCHII

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The kinetics of chain growth was studied in a single-pass continuous unit by reacting the "live" polymers of styrene with the monomer in a tetrahydrofuran solution. The chain growth rate constant is $k_p = (1.00 \times 10^6)\cdot\exp(-4{,}670/RT)$ l/mol-sec.

An analysis of the kinetic data for interaction of sodium diphenyl with styrene shows that conversion of the ion-radicals of styrene into the dianionic dimers is the limiting step in the "live" polymer formation process. The rate constant for this reaction is $k_2 = (5.6 \times 10^{11})\cdot\exp(-14200/RT)$ l/mol-sec. The effects of solvation and interaction of the ions upon the activation energies and entropies of the reactions studied were also examined.

Mechanisms of Energy Transfer in Luminescence and Chemical Radiation

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Radiolysis and luminescence of three component solutions: toluene, benzoyl peroxide, and