solves the trivalent iron molybdate. A method of phase analysis is proposed for the iron-molybdenum catalysts which are composed of $Fe_2O_3$, $Fe_2(MoO_4)_3$, and $MoO_3$.

## Tables and Graphs for Determination of Optimum Yields of Primary Products in Series—Parallel Reactions

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The author demonstrates that in the series-parallel reactions of the second order the optimum yield of the primary product, $x_{1,m}$, and the corresponding quantity of the unreacted feed, $x_{0,m}$, are defined by the mutually interchangeable functions of the direct ratio, $\alpha$, of the reaction rate constants, $k_2$ and $k_1$ (i.e., $\alpha = k_2/k_1$) and of the corresponding inverse ratio, $r$ (i.e., $r = 1/\alpha$), so that:

$$x_{1,m} = \alpha^{\frac{1}{1-\alpha}} = r^{\frac{1}{1-r}};$$

and

$$x_{0,m} = \alpha^{\frac{1}{1-\alpha}} = r^{\frac{1}{1-r}}$$

The tables of values of $x_{1,m}$ and $x_{0,m}$, corresponding to the listed values of the arguments $\alpha$ and $r$, are accurate to the fourth decimal place, when the $\alpha$ values (and those of the corresponding $r$'s) are shown to be accurate to the second decimal place. The plots of $x_{1,m}$ and $x_{0,m}$ as functions of $\alpha$ (and, therefore, also of $r$) are shown for the $\alpha$ values of 0 to 1.

## Improved Non-Gradient Reactors Equipped With a Plunger-Type Turboagitator for Study of Kinetics of Heterogeneous Catalytic Reactions

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A novel version of non-gradient reactors equipped with a plunger-type turboagitator is described. This differs in design from that described earlier in that the catalyst-holding chamber in the new version is located in the lower section of the reactor, underneath the plunger of the turboagitator. This alteration in the reactor design makes possible evaluation of performance of physically-weak granular catalysts. The reactor of the earlier design and the improvements proposed in the new version are described in detail and typical dimensions of the reactor components are listed. The cases are cited where the novel reactor could be suitably employed.

## A Reactor of Novel Design for EPR Studies of Reactions in Gaseous Phase

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A reaction vessel of novel construction is described for use in EPR investigations of rarefied flames. The vessel of the new design is operable at significantly lower flame pressures and, as a result, produces line spectra with improved resolution characteristics. The special method of heating the reactor ensures production of the flame within the spectrometer resonation zone coincident to registering of the EPR signals, which are due to the magnetic and electronic dipole-dipole induced transitions.

### Letter to the Editor

## EPR Signal Due to $CrCl_3$ on a Carrier

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It is known that with $CrCl_3$ the shape of the narrow EPR line of Lorentzian mode is due to the exchange interaction of the $Cr^{+3}$ ions via the $Cl^-$ ion. To determine if the width and shape of the EPR signal due to small concentrations of $CrCl_3$ in an inert carrier would be identical with that for the "pure" $CrCl_3$, a sample of $CrCl_3$ (2% by wt) on $\gamma$-$Al_2O_3$ support was prepared and analyzed. The method of preparation comprised soaking $\gamma$-$Al_2O_3$ in an aqueous solution of $CrCl_3 \cdot 6H_2O$, followed by drying the soaked material at a room temperature and by subsequent heating in a stream of $CCl_4$ at a temperature of 350° —to convert the added $CrCl_3 \cdot 6H_2O$ into anhydrous $CrCl_3$.

The EPR spectrum of the supported catalyst — as obtained in Spectrometer RE 13-01 at $\mu$ of 9326 M hertz— is a narrow line, with $\Delta H$ of 74 ± 2 $e$ and $g$ of 1.98 ± 0.01. The EPR spectrum of pure $CrCl_3$ has identical parameters. Analysis of the EPR spectrum of the supported $CrCl_3$ by the method of linear anamorphism shows that the line retains Lorentzian shape at its center but assumes Gaussian shape at the extremities. Thus, the analysis shows that the exchange interaction also takes place in the case of the supported $CrCl_3$ — although, due to the effect of the support, the interaction is not as great as with the pure $CrCl_3$.