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**Oxidation-Reduction Transformations of Acceptors
in Organic Solvents Induced by Ionizing Radi-
ation: Reduction of Permanganate Ions in
Acetone Solutions**

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A study was made of the radiation-induced reactions of permanganate ions dissolved in acetone. Irradiation reduces the permanganate ions to form manganese dioxide. The yields of the dioxide increase with the ion concentration, reaching 23 equivalents/100 ev in a 0.002 *M* solution.

A post-radiative reduction of permanganate was uncovered, the product yields decreasing with increasing concentrations of the permanganate. The over-all reduction yields increase with increasing concentrations of permanganate. For the 0.002 *M* solutions, the over-all yield is about 42 equivalents/100 ev. A possible permanganate ion reduction mechanism is discussed as resulting from interaction of the ions with the products of acetone radiolysis.

**Desoxybenzoin, a Molecular Intermediate in
Oxidation of 1,2-Diphenyl Ethane with Potas-
sium Permanganate**

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Oxidation of 1,2-diphenyl ethane by aqueous solutions of potassium permanganate was studied at temperatures of 56°-90°. Properties of desoxybenzoin, an intermediate product of this reaction, were also determined. It was found that desoxybenzoin oxidizes to the same products as the diphenyl ethane: dibenzoyl benzoic acid and CO₂—but that it does so at a much faster rate. In oxidation of 1,2-diphenyl ethane, the rates of formation of desoxybenzoin and of dibenzoyl are of the same order of magnitude. Consequently,

desoxybenzoin is the principal intermediate product in the diketone formation. A mechanism of oxidation of 1,2-diphenyl ethane is described.

**Radiative Oxidation of Two-Phase Hydrocarbon-
Water Systems**

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The experimental results of radiative oxidation of two two-phase hydrocarbon systems, *n*-heptane-water and *n*-heptene-water, show that with small radiation dosages the yields of peroxides, carbonyls, acids, and alcohols equal to the combined yields of products of radiolysis of individual phases of each system. In one-step processing of the two-phase systems, this fact is obscured as a result of the product redistribution between the phases by the irradiation-induced mixing.

The yields of the acids from aqueous solutions of heptene-1 exceed those from radiative oxidation with oxygen of pure heptene-1.

**Oxygen-Initiated Heterogeneous Catalytic Con-
densation of Olefins in Presence of Hydrogen:
Conversion of Propylene**

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Like ethylene, at suitable conditions propylene condenses to form liquid products. In presence of hydrogen and small amounts (1-2%) of oxygen, the product yields over a cobalt-clay catalyst at 100° are about 35% of the C₃H₆ charged. In addition to the C₆ and C₉ polymers, the reaction products contain molecules of hydrocarbons with carbon numbers not divisible by 3: such as C₄, C₅, C₇, C₈, etc. The polymerization reaction is initiated by small amounts of oxygen and, appar-