

Alkaline Persulfate as an Analytical Reagent

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Though persulfate in acid¹ or neutral solutions² has frequently been applied as a qualitative reagent, its use in alkaline³ solution has been limited to the precipitation of cobaltic oxide. Using potassium persulfate in potassium hydroxide solution, instead of ammonium persulfate in sodium hydroxide solution as used by Pozzi-Escot, a more complete precipitation of Co_2O_3 can be made (1:1,000,000).

Comparable precipitations of black Ni_2O_3 can be made from nickelous solutions by treatment with alkaline persulfate. In the absence of cobalt, it is a characteristic test for nickel, since its black will cover up the colors of other metallic hydroxides. Also in the presence of metals whose hydroxides are soluble in fixed alkalies, it can give a separation of either nickel or cobalt or both of these metals. Conversely nickel or cobalt is a qualitative test for persulfate.

Cyanides.—Alkaline persulfate oxidized cyanides, ferricyanides, ferrocyanides, nitroprussides and thioazاناتes to cyanic acid, as indicated by the following test. To any one of these, add the reagent and heat to boiling. Acidify with hydrochloric acid and again make alkaline. Moist red litmus paper on the convex side of a watch glass covering the beaker turns blue, owing to the liberation of ammonia. Without persulfate, the litmus paper remains unaffected.

Thiosulfate, but not sulfite, or arsenite, is oxidized by the reagent. Sodium peroxide liberates oxygen. These and other reactions will be studied.

¹ Caro, *Z. angew. Chem.*, 845 (1898); Marshall, *Chem. News*, 83, 76 (1901).

² Merk, *Pharm.-Ztg.*, 1022 (1905); Pozzi-Escot, *Compt. rend.*, 435, 1334 (1907).

³ Pozzi-Escot, *Ann. chim. anal. chim. appl.*, 13, 390 (1908); 14, 207 (1909); Bollenbach, *Z. anal. Chem.*, 47, 690 (1908).

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A Lubricant Insoluble in Organic Solvents

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In working with organic solvents it is occasionally necessary to lubricate a stopcock or ground-glass joint in such a manner as to maintain a vacuum or a gas-tight seal and at the same time withstand the solvent action of the liquid. Under such conditions lubricants containing petroleum grease or rubber are as a rule useless on account of their solubility in the solvent and inorganic lubricants are often unsuitable due to separation of a constituent, reaction with the solvent, solubility or freezing.

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