SIGMA-ALDRICH

3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

ProductInformation

HYDROGEN PEROXIDE, ACS REAGENT
Product Code. **21,676-3**
Exact replacement for Product Code H 0904

CAS NUMBER: 7722-84-1 (for pure compound, not solution)
STRUCTURE: H-O-O-H

PHYSICAL DESCRIPTION:

Appearance: Clear colorless liquid with an assay between 29.0 and 32.0% (w/w) hydrogen peroxide in water (redox titration).[1]
Molecular formula: H_2O_2
Molecular weight: 34.01
Density: 1.11 g/mL, giving a molarity of 9.8 M.[2]
pK_a = 11.6 in water at 25°C[3], and the pH of the 30% solution is typically between 3 and 4.[1]

The product contains 0.5 ppm stannate-containing compounds and 1 ppm phosphorus-containing compounds to stabilize the solution.[4]

Hydrogen peroxide is a powerful corrosive and oxidizing agent. Please consult the Material Safety Data Sheet for information on handling this product. The product should be stored in a closed but vented container, protected from possible contamination. Its decomposition to oxygen and water is exothermic and catalyzed by many metallic compounds, including manganese dioxide (MnO_2) and potassium iodide crystals (KI).[1]

STABILITY / STORAGE AS SUPPLIED:

When stored in the dark at 2-8°C, this product has retained full purity (by titration) for five years.[1]

SOLUBILITY AND SOLUTION STABILITY:

The product can be diluted in water, but more dilute solutions tend to be more light-sensitive than the concentrate product, and should be stored in dark containers.

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GENERAL REMARKS:

Hydrogen peroxide has a wide range of uses, from disinfectants to bleaches. It is naturally present in tissues as a result of cellular metabolism. Its mechanism of action has been well studied, and as a disinfectant, hydrogen peroxide has been shown to be generally effective with very safe by-products. Extensive information has been reported.[5] Due to the presence of low levels of catalase or peroxidase enzyme in cellular tissue, very dilute solutions can be rendered ineffective as disinfectants.[6] A 3% hydrogen peroxide solution has been used to "block endogenous peroxidase activity" in tissue sections.[7]

The concentration of a given solution can be determined using an oxidation-reduction titration method using potassium permanganate.[8] A spectrophotometric method reports a molar extinction coefficient of 43.6 at 240 nm.[9]

REFERENCES:

1. Sigma quality control data; laboratory data.
2. *Merck Index*, 12th Ed., #4839 and #4391 (1996).
3. Lange's Handbook of Chemistry, 13th Ed., p. 5-15.
4. Supplier information.
5. Block, S.S., *Disinfection, Sterilization and Preservation*, 4th Ed. (Lea & Febiger, 1991), Ch. 9, p. 167-172.
6. Ibid., p. 636.
7. *Lectins: Biology, Biochem. and Clinical Biochem.*, Vol. 8, eds. Van Driessche, E. et al., (1993), pp. 291-302.
8. *Reagent Chemicals*, 8th Ed., (AMERICAN CHEMICAL SOCIETY, 1993), p. 376-378.
9. Hildebrandt, A.G. and Roots, I., *Arch. Biochem. Biophys.*, 171, 385-397 (1975).