



SIGMA-ALDRICH

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Product Information

(-)-Riboflavin

Product Number **R 0508**
Store at Room Temperature

Product Description

Molecular Formula: $C_{17}H_{20}N_4O_6$

Molecular Weight: 376.4

CAS Number: 83-88-5

Melting Point: Approximately 280 °C

λ_{max} : 268 nm, 373 nm

Extinction coefficient: $E^{1\%1cm} = 31.62, 10.0$ (in water)¹

Specific rotation: $+56.5 - 59.5$ (c = 0.5 g/100 ml HCl, 25 °C)²

$pK_A = 9.69$ ³

Electrophoresis: This product has been tested and is suitable for use in acrylamide photopolymerization. Riboflavin may be preferred over ammonium persulfate because acrylamide polymerization will not begin until the gel is illuminated.

Riboflavin is one of the essential water soluble vitamins. It is made by all plants and many microorganism, but not by higher animals. Riboflavin is the precursor for the active enzyme cofactors riboflavin 5'-monophosphate (also called flavin mononucleotide or FMN) and flavin adenine dinucleotide (FAD). Flavin nucleotides function as prosthetic groups of oxidation-reduction enzymes known as flavoproteins. These enzymes function in the oxidative degradation of pyruvate, fatty acids, and amino acids. The flavins are reversibly reduced by the action of flavoproteins to form $FMNH_2$ and $FADH_2$.

Riboflavin deficiency in the diet results in a well-defined syndrome known as ariboflavinosis, having symptoms including cheilosis, angular stomatitis, glossitis, keratitis, and seborrhoeic dermatitis. Riboflavin is essential for the proper utilization of other vitamins such as pyridoxine or nicotinic acid, so its deficiency may cause symptoms which are related to deficiencies of other vitamins.

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

Riboflavin is slightly soluble in water. One g dissolves in 3 - 15 L water, depending on the crystal structure. It is less soluble in alcohol than in water (4.5 mg in 100 ml of absolute ethanol at 27 °C). Riboflavin is very soluble in dilute alkalies, but is unstable. A 10 mg/ml solution in 0.1 M NaOH forms a clear, yellow to orange solution.

Storage/Stability

The flavins are light sensitive and unstable in alkaline solutions. The dry solid is stable to diffuse light, but is highly photolabile in solution, especially in alkaline solutions. Neutral and acidic solutions are stable in the dark (3% decomposition per month at 27 °C at pH 6.0). Acidic solutions may be sterilized by autoclaving.

References

1. Biochim. Biophys. Acta, **39**, 178 (1960).
2. USP 25, p. 1527.
3. Data for Biochemical Research, 3rd ed., Dawson, R. M. C., et al., Oxford University Press (New York, NY: 1986), p. 136.

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