

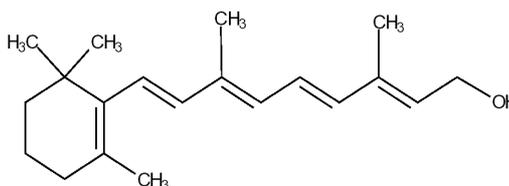
17772 Retinol

(Axerophthol, all-trans-3,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexenyl)-2,4,6,8-nonatetraen-1-ol, Vitamin-A-alcohol, Vitamin A, Vitamin A1)

CAS number: 68-26-8

Product Description:

Molecular weight: 286.5 g/mol
Formula: C₂₀H₃₀O
mp: 62-64°C (solvent free)⁴
ε_(325nm): 52,480 (ethanol)³
E_(324-325nm): 1835 (1% in ethanol)⁴



Retinol exhibits fluorescence properties with maximum absorbance and emission at 325 nm and 520 nm (cyclohexane), respectively.⁵

One unit of vitamin A (The USP unit is the same as the International Unit^{6,2}) is equal to 0.3 ug of the pure all-trans isomer of retinol which is equivalent to 0.344 ug of all-trans retinyl acetate.⁷

Solubility /Stability:

Retinol is practically insoluble in water or glycerol. It is soluble in absolute ethanol, methanol, chloroform, ether, fats and oils.⁷ Stock solutions of Retinol (1 mg/ml) were prepared in ethanol, diluted in DMSO under low light conditions and stored at -50°C under nitrogen in brown glass vials.¹¹ Retinol solutions (50 uM) were sterile filtered before use.¹¹ Retinol both as a solid and in solution is readily oxidized in air and inactivated by UV light. To reduce photodestruction of Retinol, manipulations of Retinol solutions can be performed under yellow or red light.^{12,13} Solutions may be stabilized by dissolving in oil, by the addition of anti-oxidant compounds including α-tocopherol, BHT or hydroquinone or by conversion to the palmitate and acetate esters.^{3, 22} It is recommended to prepare solutions fresh for optimal quality. However, if absolutely necessary, store solutions in the dark under an inert atmosphere at least at -20°C preferably at -70°C. Solvents preferred for storage are peroxide-free ethyl ether, acid-free acetone or ethyl acetate. For short term storage, ethanol is suitable as a solvent for spectroscopic analysis.⁴ Newest stability studies showed that **air contact is the most influential factor of losing activity (highly air-sensitive)**, after 2 hours exposition to air about ¼ quarter of the activity is lost. Daylight and water decrease as well the activity but with less strong impact. The temperature was not such important factor it was observed that sample could stay for several days at room temperature without remarkable loss of activity.²²

After opening it is recommended to set the package under argon atmosphere.
Store Retinol at -20°C, and protected from light.

Method of preparation:

Retinol all trans (Retinol) is synthetically prepared by Sigma-Aldrich. Many procedures have been reported for methods of synthesis which include synthesis from retinal⁸ and total synthesis from various starting compounds.^{4,9} Methods of purification and various assays for purity determination have been described.^{4,10}

Applications:

The isolation of retinol from human plasma has been described.¹⁴ Retinol is an effective antioxidant displaying lipoperoxy radical scavenging activity.¹⁵ The interactions between Retinol and Vitamin E (α-tocopherol) in suppressing lipid peroxidation were observed in bovine retinal membrane preparations.¹³



Retinol may influence the production of transition vesicles by stimulating the activity of a protein disulfide isomerase-like activity involved in vesicle formation.¹² Retinol may be involved in immune system mechanisms; an Retinol deficiency will depress the immune response producing a negative effect on both humoral and cellular immunity.¹⁶ Retinol (10 µM) and other retinoid compounds effectively induced sanguinarine and chelerythrine (benzophenanthridine alkaloids) accumulation in suspension-cell cultures of *Sanguinaria canadensis* in a way similar to fungal elicitation.¹¹ Retinol (10 µM) stimulated DNA synthesis and possibly repair mechanisms in Sertoli cells of rat.¹⁷

Retinol and its metabolites, including retinoic acid, are part of the retinoid class of compounds, involved in vision, normal embryo morphogenesis and in the regulation of proliferation and differentiation of a number of cell types. Current information and hypotheses on the absorption, transport, storage and metabolism of this fat soluble Vitamin A (retinol) have been reviewed.¹⁸ Studies on Retinol metabolism including its mobilization and transport in plasma and in tissues via serum and cytosolic retinol-binding proteins have been described.¹⁹

Precautions:

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

References

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