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ProductInformation

Phenol Red sodium salt
Cell Culture Tested

Product Number **P 5530**
Store at Room Temperature

Product Description

Molecular Formula: $C_{19}H_{14}O_5SNa$
Molecular Weight: 376.4
CAS Number: 34487-61-1
λ_{max}: 555 nm (free acid, 0.1 M phosphate buffer, pH 7.66)[1]; 423 nm (sodium salt, in methanol)[2]
Extinction coefficient: E^{mM} = 31.62 (free acid, 0.1 M phosphate buffer, pH 7.66)[1]
pK_a = 7.9[2]
Synonyms (free acid): phenolsulfonphthalein, phenolsulfonephthalein

This product is cell culture tested (11 mg/L) and is appropriate for use in cell culture applications.

Phenol red is used as a pH indicator. A solution of phenol red will have a yellow color at a pH of 6.4 or below and a red color at a pH of 8.2 and above.[3]

The sodium salt of phenol red is used widely in culture media to identify changes from neutral to acidic pH values. It is typically used in cell culture media at 11 mg/L. Phenol red in tissue culture media can act as a weak estrogen, especially with human breast cancer cells.[4] Lipophilic impurities, not the phenol red dye itself, account for the estrogenic activity. 95-99% of these impurities can be removed from the sodium salt of phenol red with a reduction in estrogen-like activity.[5]

Precautions and Disclaimer

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

Preparation Instructions

Phenol red is slightly soluble in water (3 mg/ml) and in alcohol (4 mg/ml).[2] Phenol red is readily soluble in aqueous alkali hydroxides or carbonates with formation of a red colored solution.[3] This product gives a dark red solution in water (1mg/ml).

Storage/Stability

Phenol red added as a component to tissue culture media can be autoclaved.

Procedure

Phenol red can be used to measure hydrogen peroxide in supernatants from cultured macrophages in multiwell plates.[6] The assay used 2 units of peroxidase/100 µl volume with 0.5 mM phenol red, pH 7 at 37 °C. The reaction was stopped and color developed by adding 10 µl of 1 N NaOH and reading the absorption of the oxidized phenol red at 600-610 nm. Calculations were accomplished by comparison to a standard curve of hydrogen peroxide.

References

1. J. Biol. Chem., **236**, 589 (1961).
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3. The Merck Index, 12th ed., Entry# 7397.
4. Berthois, Y., et al., Phenol red in tissue culture media is a weak estrogen: implications concerning the study of estrogen-responsive cells in culture. Proc. Natl. Acad. Sci. USA, **83(8)**, 2496-2500 (1986).
5. Bindal, R. D., et al., Lipophilic impurities, not phenolsulfonphthalein, account for the estrogenic activity in commercial preparations of phenol red. J. Steroid. Biochem., **31(3)**, 287-293 (1988).
6. Pick, E., and Mizel, D., Rapid microassays for the measurement of superoxide and hydrogen peroxide production by macrophages in culture using an automatic enzyme immunoassay reader. J. Immunol. Methods, **46(2)**, 211-226 (1981).

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