



Product Information

Fluorescein

Product Number **F 7505**
Store at Room Temperature

Product Description

Molecular Formula: $C_{20}H_{12}O_5$
Molecular Weight: 332.3
CAS Number: 2321-07-5
CI: 45350
 λ_{max} : 238, 284 nm¹
Extinction Coefficient: $E^{mM} = 39.8$ (238 nm),
10.0 (284 nm)
(0.01 M NaOH)
Fluorescence properties:
Excitation wavelength: 460 nm²
Emission wavelength: 515 nm²
Synonym: Acid Yellow 73

Fluorescein is a fluorophore, which has absorption maxima at 493.5 and 460 nm.³ However, the fluorescence of this compound is highly pH dependent.^{4,5,6} As a pH indicator, this product has a transition between pH 2-4.⁷ At pH 4, the solution is colorless, and at pH 4.5, a green fluorescence is exhibited.

This product is an EPA exempt dye that can be used to investigate water flow in rivers and streams. It is routinely used to track the illegal dumping of waste into waterways. Fluorescein was the first fluorescent dye used for water tracing work⁸ and is still used for qualitative (visual) studies of underground contamination of wells. It can also be used to determine fluorimeter sensitivity. The disodium salt of fluorescein is the most frequently used fluorophore in assessing tear turnover and corneal permeability.⁹ In this application, the excitation wavelength was 475-490 nm and emission wavelength was 510-520 nm with peak fluorescence at pH 7.4.

Precautions and Disclaimer

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

Preparation Instructions

This product is soluble in 1 M NaOH (50 mg/ml), with heating. It is insoluble in water, benzene, chloroform, and ether.⁶ It is also soluble in hot alcohol and glacial acetic acid solutions.

References

1. Arkiv. Kemi., **16**, 79 (1960).
2. USP XIX, p. 203.
3. Merck Index, 12th ed., Entry# 4194.
4. Klugerman, M. R., J. Immunol., **95**, 1165 (1966).
5. Emmart, E. W., Arch. Biochem. Biophys., **73**, 1 (1958).
6. Chen, R. F., Fluorescent protein-dye conjugates. II. Gamma globulin conjugated with various dyes. Arch. Biochem. Biophys., **133(2)**, 263-276 (1969).
7. CRC Handbook of Chemistry & Physics, 74th ed., Lide, D. R., ed., CRC Press (Boca Raton, FL: 1993), pp. 8-19.
8. Dole, R. B., Use of fluorescein in the study of underground waters. USGS Water Supply Paper, **160**, 73-85 (1906).
9. Nelson, J. D., Simultaneous evaluation of tear turnover and corneal epithelial permeability by fluorophotometry in normal subjects and patients with keratoconjunctivitis sicca (KCS). Trans. Am. Ophthalmol. Soc., **93**, 709-753 (1995).

CMH/RXR 1/03

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.