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## Product Information

### 4-Methylumbelliferyl phosphate

Product Number **M 8883**  
Storage Temperature -0 °C

#### Product Description

Molecular Formula:  $C_{10}H_9O_6P$   
Molecular Weight: 256.2  
CAS Number: 3368-04-5  
Melting Point: 214-216 °C<sup>1</sup>  
Specific Rotation:  $-105^\circ$  (0.25% (w/v) in water)<sup>1</sup>  
Extinction Coefficient:  $E^{mM} = 13.8$  (320 nm, 0.1 M phosphate, pH 10.4)<sup>1</sup>  
Synonyms: 4-MUP,  
4-Methylumbelliferyl-phosphoric acid

4-Methylumbelliferyl phosphate has been used as a fluorogenic substrate for calmodulin-dependent protein phosphatase<sup>2</sup> and in kinetic studies of alkaline phosphatase.<sup>1</sup> This is a sensitive substrate for alkaline phosphatase in ELISA procedures.<sup>3</sup> In enzyme immuno assays for the detection of antibodies to human immunodeficiency viruses, alkaline phosphatase with the fluorogenic substrate, 4-methylumbelliferyl phosphate, was described as being 6-7 times more sensitive than with phenolphthalein monophosphate and 8-13 times more sensitive than with p-nitrophenyl phosphate<sup>4</sup>

The cleavage product, 4-methylumbelliferone, is intensely fluorescent at pH 10.3, with an excitation maximum at 364 nm, and a fluorescence emission maximum at 448 nm. At pH 5, the fluorescence is less intense but still easily measurable. The excitation maximum is shifted to 330 nm.<sup>5</sup>

4-Methylumbelliferyl Phosphate (4-MUP) Liquid Substrate System, Product No. M 3168, combines 4-methylumbelliferyl phosphate (4-MUP) at a concentration of 0.6 mM and buffer, pH 10, in a single solution, ready-to-use reagent for use in procedures utilizing alkaline phosphatase enzyme label.

#### Precautions and Disclaimer

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

#### Preparation Instructions

This product is soluble in water (25 mg/ml), yielding a clear to slightly hazy, colorless solution.

#### References

1. Fernley, H.N., and Walker, P.G., Kinetic Behaviour of Calf-Intestinal Alkaline Phosphatase with 4-Methylumbelliferyl Phosphate. *Biochem. J.*, **97**, 95-103 (1965).
2. Anthony, F.A., et al., A spectrofluorimetric assay of calmodulin-dependent protein phosphatase using 4-Methylumbelliferyl phosphate. *Anal. Biochem.*, **155(1)**, 103-107 (1986).
3. Mierendorf, R.C. Jr., and Dimond, R.L., Functional heterogeneity of monoclonal antibodies obtained using different screening assays. *Anal. Biochem.*, **135(1)**, 221-229 (1983).
4. Roberts, I.M., et al., A comparison of the sensitivity and specificity of enzyme immunoassays and time-resolved fluoroimmunoassay. *J. Immunol. Methods*, **143 (1)**, 49-56 (1991).
5. *Meth. Biochem. Anal.*, Vol. 17, 254 (1969).

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