3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

ProductInformation

METHIDIUMPROPYL EDTA (MPE)

Product Number **M 6164**
Storage Temperature 0 °C

Product Description

MPE•Fe(II) is a bifunctional conjugate of the DNA intercalating moiety methidium chloride and the hydroxy radical generating function EDTA•Fe(II). The iron chelate, prepared by adding $Fe(NH_4)_2(SO_4)_2$, effects random oxidative cleavage of DNA in the presence of O_2 and a reducing agent.[1] It has been extensively used as a footprinting reagent to study ligand-DNA interactions.[1-7] Compared to DNase I,[2] the smaller size of MPE and its reduced sequence specificity make it particularly useful for determining the DNA binding domain of small molecules[2-5] and proteins.[6] MPE•Fe(II) has also been useful as a DNA cleaving agent in the study of chromatin structure.[7]

Procedure

MPE•Fe(II) is freshly prepared by adding a stoichiometric amount of ferrous ammonium sulfate, Product No. F 2262, to an aqueous solution of MPE [10 to 100 µM]. Prior to metalation, the concentration of MPE maybe determined optically by using an extinction coefficient of 5,994 $M^{-1}cm^{-1}$ at 488 nm or 54,725 $M^{-1}cm^{-1}$ at 286 nm.[1] One µg of pBR322 DNA in 50 µl of 1 mM sodium ascorbate, Product No. A 7631, was incubated with 1, 0.1, and 0.01 µM MPE•Fe(II) at 37 °C for 1 hour.

Reaction mixtures were immediately analyzed using agarose gel electrophoresis. At various concentrations, random oxidative cleavage is seen.

References

1. Hertzberg, R. P. and Dervan, P. B., Biochemistry, **23,** 3934 (1984).
2. Van Dyke, M. W., and Dervan, P. B., Nucleic Acids Res., **11,** 5555 (1983).
3. Van Dyke, M. W., et al., Proc. Natl. Acad. Sci. USA, **79,** 5470 (1982).
4. Van Dyke, M. W. and Dervan, P. B., Biochemistry, **22,** 2373 (1983).
5. Van Dyke, M. W., and Dervan, P. B., Science, **225,** 1122 (1984).
6. Landolfi, N. F., et al., BioTechniques, **7,** 500 (1989).
7. Cartwright, I. L., et al., Proc. Natl. Acad. Sci. USA, **80,** 3213 (1983).

JLL/JWM 04/04