

PRODUCT MANUAL

for the

METAL-FREE TRAP COLUMN (MFC-1)
(P/N 037017)

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SECTION 1 - INTRODUCTION

The Metal-Free Trap Column (MFC-1) is specially designed for the on-line cleanup of eluent ionic transition metal impurities in Ion Chromatography. It is typically installed between the pressure transducer on the pump and the injection valve.

The MFC-1 is packed with 200 μm particles of a 15-20 % cross-linked styrene-divinylbenzene copolymer which has been fully functionalized with covalently bonded iminodiacetic acid functional groups. This results in a resin of medium hydrophobicity and a capacity of 170 μeq /column. The physical rigidity of this chelating resin allows the MFC-1 to be used at pressures up to 3,500 psi.

The MFC-1 has a very high selectivity for transition and lanthanide elements (see Table 1, "Retention Characteristics of the Metal-Free Trap Column (MFC-1)"). The MFC-1 strips transition and lanthanide impurities, which are too concentrated for trace analysis, from the eluent. The metals which are trapped by the MFC-1 can be readily removed from the MFC-1 with acid regenerants.

Table 1
Retention Characteristics of the Metal-Free Trap Column (MFC-1)

Metal Ion	Quantitative	Metal Ion	Quantitative
Ti (IV)	YES	Cd (II)	YES
V (IV,V)	YES	In (III)	YES
Cr (III)	NO	Y (III)	YES
Mn (II)	YES	Lanthanides	YES
Fe (II,III)	YES	Hg (II)	YES
Co (II)	YES	Pb (II)	YES
Ni (II)	YES	Al (III)	YES
Cu (II)	YES	Tl (I,III)	NO
Zn (II)	YES	AS (III,V)	NO
Ag (I)	YES	Se (IV,VI)	NO

SECTION 2 - INSTALLATION AND COLUMN CARE

2.1 Installation

Install the MFC-1 between the pressure transducer on the pump and the injection valve.

2.2 Recommended Operating Pressures

Operating a column above its recommended pressure limit can cause irreversible loss of column performance. The maximum recommended operating pressure for the MFC-1 is 3,500 psi.

2.3 Column Start-up

The MFC-1 is shipped with 0.5 M NaOH as the storage solution.

Before placing the MFC-1 in line with the analytical column, rinse the column with 10 mL of the eluent used for the analytical separation.

2.4 Column Storage

The MFC-1 should be stored above pH 5 in the salt form. For short term storage, flush approximately 5 mL of 2.0 M ammonium acetate, pH 5.4 (P/N 033440) through the column. For long term storage, flush the column with 50 mL of 0.5 M NaOH.

2.5 Column Cleanup

- A. For cleanup, flush with approximately 20 mL of 1.5 M HNO₃.
 - B. Following cleanup, convert the column to the eluent form by equilibrating it with the eluent (e.g., NaOH) for 30 minutes.
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