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## Preconcentration and Determination of Trace Amounts of Heavy Metals in Water Samples Using Membrane Disk and Flame Atomic Absorption Spectrometry

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**摘要** A fast and simple method for preconcentration of  $\text{Ni}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Co}^{2+}$  from natural water samples was developed. The metal ions were complexed with sodium diethyldithiocarbamate (Na-DDTC), then adsorbed onto octadecyl silica membrane disk, recovered and determined by FAAS. Extraction efficiency, influence of sample volume and eluent flow rates, effects of pH, amount of Na-DDTC, nature and amount of eluent for elution of metal ions from membrane disk, break through volume and limit of detection have been evaluated. The effect of foreign ions on the percent recovery of heavy metal ions has also been studied. The limit of detection of the proposed method for  $\text{Ni}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Co}^{2+}$  was found to be 2.03, 0.47, 3.13, 0.44, 1.24 and 2.05  $\text{ng}\cdot\text{mL}^{-1}$ , respectively. The proposed (DDTC) method has been successfully applied to the recovery and determination of heavy metal ions in different water samples.

**关键词** [preconcentration](#) [atomic absorption spectrometry](#) [solid phase extraction](#) [octadecyl bonded silica](#)

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**Abstract** A fast and simple method for preconcentration of  $\text{Ni}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Co}^{2+}$  from natural water samples was developed. The metal ions were complexed with sodium diethyldithiocarbamate (Na-DDTC), then adsorbed onto octadecyl silica membrane disk, recovered and determined by FAAS. Extraction efficiency, influence of sample volume and eluent flow rates, effects of pH, amount of Na-DDTC, nature and amount of eluent for elution of metal ions from membrane disk, break through volume and limit of detection have been evaluated. The effect of foreign ions on the percent recovery of heavy metal ions has also been studied. The limit of detection of the proposed method for  $\text{Ni}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Co}^{2+}$  was found to be 2.03, 0.47, 3.13, 0.44, 1.24 and 2.05  $\text{ng}\cdot\text{mL}^{-1}$ , respectively. The proposed (DDTC) method has been successfully applied to the recovery and determination of heavy metal ions in different water samples.

**Key words** [preconcentration](#) [atomic absorption spectrometry](#) [solid phase extraction](#) [octadecyl bonded silica](#)

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