



Ömer DALMAN<sup>1</sup>, Volkan Numan BULUT<sup>2</sup>,  
İsmail DEĞİRMENCİOĞLU<sup>1</sup>, Mehmet TÜFEKÇİ<sup>1</sup>

<sup>1</sup>Karadeniz Technical University, Department of Chemistry, 61080 Trabzon-TURKEY

<sup>2</sup>Karadeniz Technical University, Department of Chemistry, 28049 Giresun-TURKEY

e-mail: dalman@ktu.edu.tr

 [Keywords](#)  
 [Authors](#)



[chem@tubitak.gov.tr](mailto:chem@tubitak.gov.tr)

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**Abstract:** The use of chemically modified XAD-4-1,2-bis (o-aminophenylthio) ethane chelating resin for preconcentrating Cr<sup>6+</sup>, Mn<sup>2+</sup>, Fe<sup>3+</sup>, Co<sup>2+</sup>, Cu<sup>2+</sup>, Cd<sup>2+</sup>, Zn<sup>2+</sup>, Pb<sup>2+</sup>, and Ni<sup>2+</sup> was studied using flame atomic absorption spectrometry (FAAS) for metal monitoring in environmental samples. Cd<sup>2+</sup>, Zn<sup>2+</sup>, Pb<sup>2+</sup>, and Ni<sup>2+</sup> ions were quantitatively recovered at the rate of 96.0%, 101.0%, 101.0%, and 95.0%, respectively (RSD < 5%), from the studied solutions. The procedure is based on the retention of analytes on a short column of 1,2-bis (o-aminophenylthio) ethane-XAD-4 chelating resin from a buffered sample solution and subsequent elution with 1 M HNO<sub>3</sub>. Various parameters, such as pH, eluent type, and concentration, flow rate of sample solution and matrix interference effect on the retention of the metal ions have been studied. The optimum pH for the sorption of the above-mentioned metal ions was about 6. The adsorption and batch capacity of adsorbent and loading half time (t<sub>1/2</sub>) for Ni<sup>2+</sup>, Zn<sup>2+</sup>, Cd<sup>2+</sup>, and Pb<sup>2+</sup> were established. The limit of detection was 3.0 μg L<sup>-1</sup> for Pb<sup>2+</sup> and Ni<sup>2+</sup>, 0.6 μg L<sup>-1</sup> for Cd<sup>2+</sup>, and 0.3 μg L<sup>-1</sup> for Zn<sup>2+</sup>. The validation of the procedure was carried out by analysis of certified reference materials and standard addition. The proposed enrichment method was applied to environmental samples from Trabzon.

**Key Words:** Water, trace element, preconcentration, Amberlite XAD-4, FAAS, 1,2-bis (o-aminophenylthio) ethane, chelating resin

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