ABSTRACT

METHOD DEVELOPMENT OF FLAME ATOMIC ABSORPTION SPECTROSCOPY FOR DETERMINATION OF LEAD USING COMPLEXING AGENT AMMONIUM PYRROLIDINE DITHIOCARBAMATE

Muhammad Yusuf

Lead has long been known as a potential health hazard. Prolonged intake of even low concentrations of lead can cause serious problems for human health. As a consequence, an appropriate analytical method is needed for routine environmental field surveys of lead. The methods should have good reproducibility, high recoveries, and low interferences of matrix constituents. For this reason, preconcentration technique is used for the determination of trace level of lead. The ammonium pyrrolidine dithiocarbamate was used as complexing agent for lead preconcentration. Lead was reacted with ammonium pyrrolidine dithiocarbamate to form a complex which was further extracted into the methyl isobutyl ketone and followed by back-extraction to HNO_3. This study is aimed to find the optimum pH, and concentration of HNO_3 for determination of lead by flame atomic absorption spectrocospy. This method was validated in terms of accuracy, precision, linearity, limit of detection and limit of quantitation with guidelines from ICH, USP, and AOAC. The optimum pH and concentration of HNO_3 were obtained at pH 5 and HNO_3 1%, respectively. The linearity lies from 1 to 9 mg/L for lead with a correlation coeficient of 0.9998. The recovery studies show lead in the range from 92 to 105 % were obtained at various concentrations with RSD less than 2%. Based on experimental results, this proposed method could be applied for the routine analysis of lead.

Keywords: Lead, ammnonium pyrrolidine dithiocarbamate, flame atomic absorption spectrocospy, preconcentration, validation