288p Enrichment of Lead (II) Ions Using Phthalic Acid Functionalized Xad-16 Resin as a Sorbent

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A simple and reliable method has been developed using polymeric material containing phthalic acid as a chelating agent, to concentrate ultratrace amounts of lead ions in aqueous solutions. After the characterization by CHN, IR and thermal studies the static and dynamic sorption behavior of Pb (II) ions onto new synthetic resin has been investigated. The sorption has been optimized with respect to pH, shaking speed and contact time between the two phases. Maximum sorption is achieved from solution of pH 5-8 after 10 minutes agitation time. The lowest concentration for quantitative recovery is 5.8 ng cm3with a preconcentration factor of ~ 850. The kinetics of sorption follows the first order rate equation with the rate constant, k, = 0.58°"0.04 min-1. The variation of equilibrium constant, Kc, with temperature between 10 to 50¢XC yields values of ƒxH, 52.4°"1.65 kJmol-1, ƒxS, 186°"5.21 Jmol-1K-1 and ƒxG303K -4.15°"0.002 kJmol-1. The sorption data of Pb (II) ions in the concentration range of 2.41„e10-6 to 1.44 „e10-4 mol L-1 follows Langmuir, Freundlich, and Dubinin-Radushkevich (D-R) isotherms at all temperatures investigated. The sorption of Pb (II) ions onto synthesized resin in the presence of common anions and cations has also been measured. The possible sorption mechanism of lead (II) ions onto phthalic acid modified XAD-16 is also discussed. The sorption procedure is utilized to preconcentrate Pb (II) ions prior to their determination in automobile exhaust particulates by atomic absorption spectrometry using direct and standard addition methods.