

DEVELOPMENT OF AN AIRBORNE LEAD ANALYSIS KIT AND ITS APPLICATION

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Abstract. We developed a method to analyze airborne lead concentrations in the field. It was a modification of the colorimetric method using the reaction between 4(2-pyridylazo)-resorcinol (PAR) and lead with cyanex302 in an acid medium to reduce interfering metals. The lead concentration was detected with a photometer made in Thailand. The developed method uses an impinger containing 1% nitric acid solution as an absorbing agent to collect airborne lead at a flow rate of less than or equal to one liter/minute. Cyanex302 solution in toluene was used to extract metals from the samples and 0.1M nitric acid was used to extract just lead. The lead solution was reacted in 0.5 ml of 0.03% PAR solution, with 1 ml ammonium chloride buffer; the absorption of this solution was measured by a photometer. The results show the limit of detection (LOD) was 0.01 mg/l. The limit of quantification (LOQ) was 0.03 mg/l. The percent recovery of the lead concentrations of 0.05 - 3.0 mg/l was 94.0 to 103.5%. The precision presented as %CV ranged from 0.65 to 10.27%. Lead concentration in a lead smelting factory detected by this method was not significantly different from that detected by the NIOSH method: 7,303 at a 95% confidence level.

Key words: airborne lead analysis, colorimetric method

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