

E2-37: Measurement of total lead in the atmosphere

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The existing standard methods (WHO & ASTM) to monitor lead (Pb) in the atmosphere measures only a fraction of total lead in the form of particulate matter that can be trapped by a 0.45 μm cellulose filter paper. The total lead content in ambient air is a useful guide to see the urban atmospheric pollution. As such, a reliable method to determine the total lead levels was developed and the findings are presented.

In this method no digestion procedure is involved and it is directed towards the possible determination of all forms of lead in the atmosphere.

A sample of air is bubbled through a sample train of 6 impingers, each containing dithizone and other masking agents in basic aqueous medium. Finally the lead dithizonate complex is extracted into the chloroform layer and analysed using spectrophotometry. The spectrophotometric results were compared with those of other methods such as atomic absorption spectrophotometry and AC polarography. The data was analysed using the Friedman's Test. There was no significant difference between the 3^m different techniques used (at 5% level of significance).

This method reads all forms of lead such as metallic lead, lead halides, oxides and organo metallic lead which are probably present in the atmosphere.

The results obtained by this new method indicate that the ambient lead concentration in a residential area, of Colombo urban environment was about $200 \mu\text{g}/\text{m}^3$ and about $400 \mu\text{g}/\text{m}^3$ in the vicinity of a main road. Whereas threshold value of ambient lead level stipulated by the Central Environmental Authority (CEA) is $2\mu\text{g}/\text{m}^3$ for 24h average.