

## USING INDUCTIVE COUPLED PLASMA MASS SPECTROMETRY (ICP-MS) TO DETERMINE Pb, Cd AND As ACCUMULATION IN THE LICHEN *Parmotrema tinctorum*

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**Abstract:** Analytical technique using inductive coupled Plasma Mass Spectrometry (ICP-MS, PerkinElmer's NexION 300Q) was developed to determined the amount of Pb, Cd and As accumulation in the lichen *Parmotrema tinctorum*. In the previous study these heavy metals were under detection by using ion chromatography. Therefore interpretation of the study on using lichen to indicate air pollution was limited. Improving precision of the analytical method enhance our understanding and awareness of the harmful effects of these heavy metals. Lichen samples from nine sites were analyzed for the three problematic metals. The concentration of Pb, Cd and As in lichens were determined by ICP-MS. The method was validated in terms detection limit, precision and linearity. It was found that the detection limit for Pb, Cd and As were 2.50, 0.70 and 2.52  $\mu\text{g/L}$  respectively and the detection limit from lichen matrix for for Pb, Cd and As were 18.38, 2.42 and 2.91  $\mu\text{g/L}$  respectively, precision in seven repetitions (%RSD) of 50 ppb were 3.89, 4.87 and 4.37% respectively and the linearity in term correlation coefficient ( $r^2$ ) were 0.9998, 0.9988 and 0.9999 respectively. The amounts of these heavy metals found in lichens were: Pb ranged from  $22.5\pm 6.4$  to  $34.6\pm 12$ , Cd  $2.4\pm 0.6$  to  $3.8\pm 1.2$ , As <DL to  $3.0\pm 0.7$   $\mu\text{g/g dw}$ . The results indicated that lichen had different concentration of Pb and Cd of 1.5 folds, with As had the greatest differences of 3 folds. This data implied that atmospheric deposition of heavy metals were different among the nine sites. This information should be distributed for awareness of air quality and public health.

### References:

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