

E2-71: Fractionation of aluminium in acidic well waters at Ranala, Kaduwela

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Three operationally defined fractions of aluminium : total aluminium, total monomeric aluminium and non-labile monomeric aluminium in acidic well waters at Ranala, Kaduwela were determined.

Water samples acidified to $\text{pH} < 2$ and unacidified were utilized for determination of total aluminium and total monomeric aluminium respectively. Amberlite IR 120 cation exchange resin in the Na^+ form, freshly packed in a polypropylene column was used for separation of the non-labile monomeric fractions of aluminium in unacidified water samples from the labile monomeric fractions.

The concentration of aluminium in all three fractions were determined spectrophotometrically by converting aluminium into aluminium-pyrocatechol violet complex in $\text{pH} 6.1$ hexamine buffer solutions and measuring the absorbances at the optimum wavelength of 585 nm .

Interference due to iron was masked by converting iron into the iron - 1, 10 phenanthroline complex. The concentration of labile monomeric aluminium too was determined by subtracting the concentration of non labile monomeric aluminium from the total monomeric aluminium concentration. Relative standard deviation for eight replicate measurements were 5.2% and the linear dynamic range of the calibration curve extended upto $300 \mu\text{g}/\text{dm}^3$. Percentage recovery of aluminium determination was 95% .

pH of all well waters were below the safe limit of 5.6 recommended by the World Health Organization (WHO). The concentration of total aluminium in well waters too were above the tolerance limit of $50 \mu\text{g}/\text{dm}^3$ recommended by WHO. In all wells the concentration of labile monomeric fractions were higher than the non-labile monomeric fraction, and the highest value of $1100 \mu\text{g}/\text{dm}^3$ was obtained for the water sample with the lowest pH of 3.5 .

Financial assistance by University of Kelaniya. (Research grant RP/RG/97/01 (8)) is acknowledged.