

INTERLABORATORY COMPARISONS OF SELECTED PARAMETERS  
CONCERNED WITH THE QUALITY OF POTABLE WATERS

H Dasaratha Gunawardhana

*Centre for Analytical Research and Development,  
Dept. of Chemistry, University of Colombo*

The following laboratories participated in the above study: Analytical Chemistry Section, CISIR; Central Environmental Authority; Centre for Analytical Research and Development, University of Colombo; Department of Chemistry, University of Kelaniya; Department of Civil Engineering, University of Moratuwa; Division of Occupational Hygiene, Department of Labour; Environmental Laboratories Ltd.; Geological Survey Department; National Aquatic Resources Agency; National Water Supply and Drainage Board and Water Resources Board.

As Stage I of the project, a synthetic water sample which conforms to the WHO International Standards for potable waters, was distributed among the eleven laboratories. The analyses for seven parameters, namely, chloride, sulphate, calcium, magnesium, sodium, zinc and copper were compared among the eleven laboratories, each using its usual methodology. Concentrations of chloride, calcium, zinc and copper, generally agreed with the reference data of the synthetic water sample. However, the concentrations of sulphate,

magnesium and sodium showed a wide variation resulting in a poor interlaboratory precision. Certain values reported for the latter parameters by some laboratories have been rejected with 90% confidence to improve the interlaboratory precision and accuracy. The laboratory representatives and the co-ordinator discussed the possibilities of the occurrence of determinate errors which have led to poor interlaboratory accuracy and further actions were agreed upon to eliminate such errors in future comparisons.

As a test of improved analytical protocols, a second synthetic sample containing the same parameters was distributed among the eleven laboratories. Improved interlaboratory precision and accuracy have been observed in the analyses of sulphate, magnesium, sodium and copper. This is an achievement of our interlaboratory comparison. With the exception for chloride, the results from one laboratory were significantly different from those of the other ten laboratories. Rejection of the results from this laboratory with 90% confidence, has led to a great improvement of the interlaboratory precision. For improved precision in future comparisons following actions have been recommended: (a) Intra-laboratory comparison, (b) Rejection of erroneous analytical methods, (c) Elimination of personal errors in calculating the results (d) Necessary precautions in the preparation of analytical standards.

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#### References

1. Best, G.A. (1980), Analytical Proceedings 17 191-194.
2. MacLeod, W.D. et al (1982) Anal. Chem 54 386-392.
3. Ramakrishna, R.S. (1984) Chemical analysis in small scale industry in Sri Lanka p. 73-74, UNESCO Publication.