

Abstract Submitted
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A Study of the Accuracy and Precision Among XRF, ICP-MS, and PIXE on Trace Element Analyses of Small Water Samples SAHIL NAIK, RITISH PATNAIK, VENKATA KUMMARI, LUCAS PHINNEY, MANGAL DHOUBHADEL, University of North Texas - Physics, AARON JESSEPH, WILLIAM HOFFMANN, GUIDO VERBECK, University of North Texas - Chemistry, BIBHUDUTTA ROUT, University of North Texas - Physics — The study aimed to compare the viability, precision, and accuracy among three popular instruments - X-ray Fluorescence (XRF), Inductively Coupled Plasma Mass Spectrometer (ICP-MS), and Particle-Induced X-ray Emission (PIXE) - used to analyze the trace elemental composition of small water samples. Ten-milliliter water samples from public tap water sources in seven different localities in India (Bangalore, Kochi, Bhubaneswar, Cuttack, Puri, Hospet, and Pipili) were prepared through filtration and dilution for proper analysis. The project speculates that the ICP-MS will give the most accurate and precise trace elemental analysis, followed by PIXE and XRF. XRF will be seen as a portable and affordable instrument that can analyze samples on-site while ICP-MS is extremely accurate, and expensive option for off-site analyses. PIXE will be deemed to be too expensive and cumbersome for on-site analysis; however, laboratories with a PIXE accelerator can use the instrument to get accurate analyses.

Sahil Naik
University of North Texas - Physics

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