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## Application of nuclear interactions for material analysis: A case study of determination of metal contaminants from industrial effluents in North-West Nigeria using NAA technique

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Neutron Activation Analysis (NAA), a non-destructive nuclear analytical technique that meets the criteria of experimental simplicity, analytical accuracy and flexibility has been applied to investigate the metal contents of industrial effluents collected at several sites in North-Western part of Nigeria. Ten elements (Cr, Co, Ca, Na, Eu, Hf, Th, Dy, Sb and Cs) were determined from 10 samples from the leather, textile and petrochemical industries. The enrichment factors were determined by comparison of the elemental concentration with that of a typical soil from an uninhabited, uncultivated, non-industrial area within the same locality of the survey. The analytical result shows that some of the industrial effluents have high elevated concentration for chromium, calcium, cobalt, sodium, antimony, and dysprosium. The most distinct being chromium from the tanneries due to the chemical processing stage of leather products involving tanning with chrome. Certified reference material was used during the analyses as quality control to assure the analytical quality of the results. The successful application of this nuclear analytical technique during this study confirms its suitability to environmental studies and the applicability of the k0-NAA method in the Nigeria Research Reactor-1 (NIRR-1) laboratories.

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