

Applications of proton-induced X-ray emission technique in materials and environmental science

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Abstract In this work a complex study of the capabilities of Particle-Induced X-ray Emission (PIXE) technique for the determination of minor constituents of some metallurgical and environmental samples has been done. PIXE analyses have been carried out using a 3 MeV proton beam generated with the aid of the 8.5 MV FN Van de Graaff tandem accelerator of the "Horia Hulubei" National Institute of Physics and Nuclear Engineering (NIPNE) Bucharest. The minor elements identified in the metallurgical samples (steels) using PIXE were: K, Ca, V, Cr, Mn, Fe, Co, Cu, Ni, Zn, W, Ga, As, Pb, Mo, Rb, In, Rh, Zr, Pd, Nb, Sn and Sb. In the investigated environmental samples (vegetal leaves, soil and mosses) PIXE analysis allowed determination of S, Cl, K, Ca, Ti, Cr, Mn, Fe, Ni, Cu, Zn, As, Sr, Se, Br, Hg and Pb in concentrations between 0.05-290 mg/kg.

Keywords: PIXE technique, environmental samples, metallurgical samples, minor elements
