

Low Energy Nuclear Techniques and Microscopy in Surface Analysis of Materials

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Surface analysis of materials has been performed by several complementary techniques. Nuclear techniques give absolute values of concentrations of isotopes and elements for a few microns close to the surface, using low energy MeV ion beams [1-6]. The energy analysis method is used for ion-ion reactions. At a suitable bombarding energy, an energy spectrum is recorded of ions from reaction events occurring at several depths in the target. Such spectra are computer predicted and compared to data, giving target composition and concentration profile information [4-7]. A computer program has been developed in this context [4-6]. Depth profiling of ^{12}C and ^{18}O is made by $^{18}\text{O}(p,\alpha_0)^{15}\text{N}$ and $^{12}\text{C}(d,p_0)^{13}\text{C}$ reactions, respectively, in thick targets. Elastic scattering of $(^4\text{He})^+$ ions is applied to thin targets. Experimental details are available [4]. SEM is used as a complementary technique. High potentialities arise from the combined use of nuclear techniques and microscopy, as highly powerful analytical tools for non-destructive surface analysis of materials [8].

References:

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