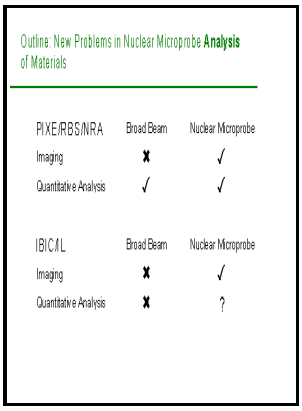
Materials analysis using a nuclear microprobe

John Wiley - Materials analysis at the SNL/LLNL nuclear microprobe



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[PDF] Materials Analysis Using A Nuclear Microprobe

A 4 ~ ion e travels a much shorter distance than a 'H ion of the same energy because of its higher rate of energy loss. Knowledge of the stopping power of the sample also allows depth profiles of elements to be extracted from the energy spectrum. Top: Raw X-ray intensity images from windows placed in the energy spectrum from a 3 MeV ' H ion irradiated test sample of pure metal foils.

Nuclear microscopy: A new way of analyzing materials

The configuration of the Oxford sample chamber, similar to many chambers in use elsewhere. TOF-ERD computer software written on site to simulate spectra and to convert time spectra into depth profiles is also presented. This makes the high-energy regime relatively straightforward to model and facilitates quantitative analysis using MeV ion-beam analytical techniques.

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It can be derived, in the laboratory reference frame to second order, by treating the collision as a two-body scattering problem as Equation 1. At just that time, studies relating to electron microscopy at MeV energies, including theoretical work on magnetic quadrupole lenses, had been published.

FANM: A software for focus and aberrations of nuclear microprobe

Overheating of slits should be avoided, since thermal expansion can cut off the beam. INTRODUCTION It is the purpose of this chapter to discuss how the various ion-solid interactions, introduced in Chapter 1, are used in a nuclear microprobe to make images. Also, the sample stage is mounted on the top flange of the chamber.

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It is very difficult to get this alignment exactly right. This means that the double focusing magnet also fills the role of the condenser lens system.

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High-current techniques are those such as backscattering spectrometry, PIXE, NRA, ERDA, CCM, and IBIL, where a beam current of 100 pA or more is required to obtain good images in a reasonable time -1 hr. Computer simulations and experiment show that the axial minimum yield actually is approximately a factor of three greater than predicted by this simple model. Campbell, PIXE: A Novel Techrricp~~for Elemetlral Annlyis.

Materials analysis with nuclear microprobes: Superconductors and buried conductors (Conference)

The total energy spectrum can only be used as an approximate guide to the structure of the sample, since it is the superposition of all the different energy spectra from the different subregions of the sample within the scanned area. The present state of the art for a 100 pA beam, the presupposed minimum necessary for PIXE or RBS, is 0.

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