

High resolution nuclear and X-ray microprobes and their applications in single cell analysis

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*NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION B-
BEAM INTERACTIONS WITH MATERIALS AND ATOMS 181 (2001) 715-722*

Investigations of uptake of different chemical compounds by single cells have become a very popular topic and have been performed with different microanalytical techniques using electron, laser, ion and X-ray beams. With the advent of nuclear microprobes with submicron resolution it has been possible to investigate distribution of different elements inside individual cell with sensitivity of parts-per-million (ppm). Recently, with X-ray beams focused to 150 nm and high intensity obtained from third generation synchrotron facilities it became possible to perform analysis on a single cell with sensitivity of parts-per-billion (ppb). Synchrotron radiation offers also a unique possibility to investigate an oxidation state for different elements. In this paper, authors will present and discuss data from experiments on single cells performed with high resolution nuclear and X-ray microprobes.