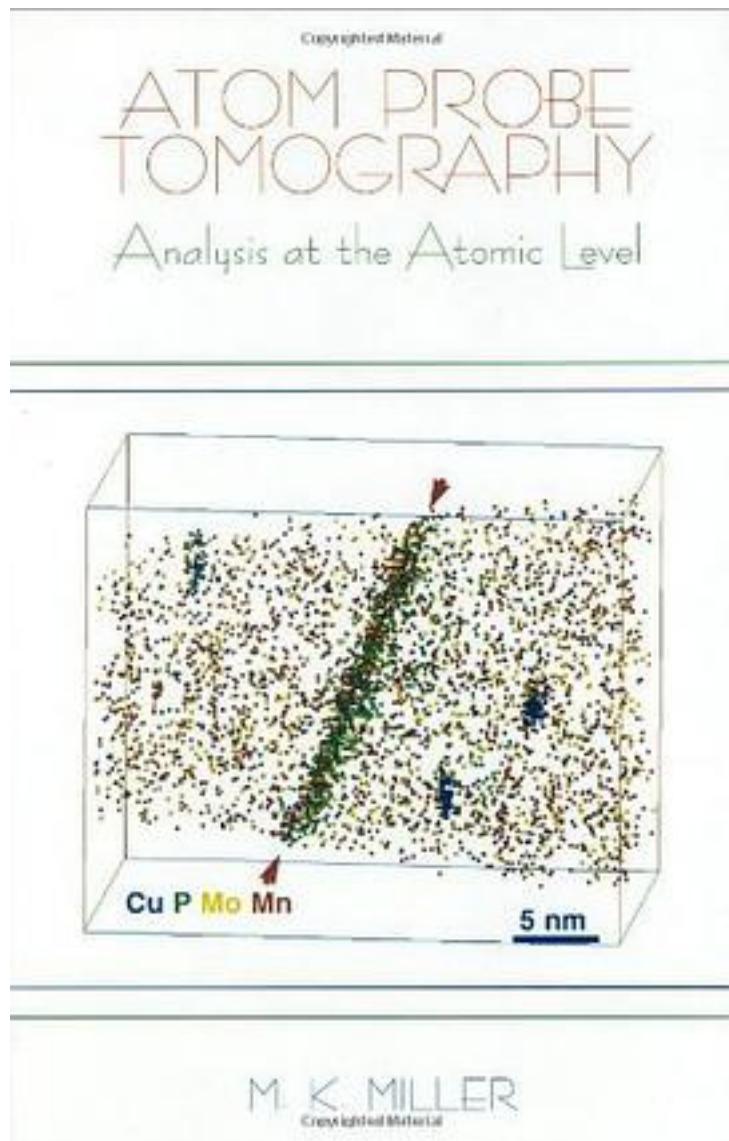


Atom Probe Tomography



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Written by the inventor of the technique, this book provides the first complete description of atom probe tomography (APT). This microanalytical technique enables the distribution of all the elements present in a material to be experimentally determined. The instrument known as a three-dimensional atom probe (3DAP) is able to determine the spatial coordinates and the elemental identities of the individual atoms in a metal with atomic resolution. The compositions of small volumes are determined by simply counting the number of atoms of each type within that volume, and thus the technique provides a fundamental measure of the local concentration. The book provides a brief history of the development of the APT technique and the different types of three-dimensional atom probes that have been developed. The various methods of fabricating the needle-shaped specimens and the procedures used to obtain high resolution images of the specimen with field ion microscopy and to conduct a three-dimensional atom probe analysis are described in detail. Special attention is given to the selection of the experimental parameters required to provide accurate analyses. The methods of visualizing and analyzing the three-dimensional data are described. The technique has been used to characterize the microstructures of a wide spectrum of metals ranging from simple model systems to complex commercial alloys. A comprehensive list of papers relating to the metallurgical applications of atom probe tomography is included.

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