

1.1. OVERVIEW AND PRINCIPLES

sciences as instrumentation and computer modelling become ever more powerful. Although intense modern X-ray and electron sources can measure data from tiny single crystals (of a size approaching that of a single powder grain), this does not diminish the usefulness and impact of powder diffraction, as powder diffraction is much more than just crystal structure solution. It probes real materials in real environments, yielding information about defects, texture, nanostructure, strain, phase composition, kinetics, phase transformations, size and shape distributions, and heterogeneity. In short, crystallography gives us the structure, but powder diffraction allows us to study the ‘materials science’, of materials.

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