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Microbeam analysis — Methods of specimen preparation for analysis of general powders using WDS and EDS

Analyse par microfaisceaux — Méthodes de préparation des échantillons pour l'analyse des particules

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Contents

Page

Foreword

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This document was prepared by Technical Committee ISO/TC 202, *Microbeam analysis*.

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Introduction

Although there are many applications of electron probe microanalysis (EPMA) and scanning electron microscopy (SEM) for powder analysis, there are some difficulties, especially in the case of individual particle analysis, as follows:

(a) the prevention of agglomeration of particles during preparation of the specimen;

(b) the fixation of specimens, especially when there is a small amount of tiny particles, either for surface analysis or cross-section analysis;

(c) the cross-section preparation in the case of small particles with core-shell structures;

(d) the protection of particle surfaces from damage by electron beam irradiation in cases where the surfaces of particles are sensitive;

(e) the counteraction of charging of the specimen under electron radiation to prevent the powder from scattering or dispersing due to electrical repulsion;

(f) the interpretation of qualitative and/or quantitative analysis results when the X-ray generation volume is larger than that of the particles.

Even in the case of elemental compositional analysis of a powder, the specimen preparation can affect the results of analysis, because the roughness and/or void space within a particle aggregate or agglomerate can impact X-ray intensity.

To cope with these difficulties, the standardization of specimen preparation for particle analysis is very important.