

MiniFlex300/600

Measurement with fluorescent X-ray reduction mode of D/teX Ultra

Introduction

Powder X-ray diffractometers are used in many fields of industry and research, for substances ranging from inorganic materials such as ceramics and minerals, to pharmaceuticals and other organic materials. The MiniFlex Series is a line of benchtop instruments - with 1/20 the volume, and 1/10 the weight, of stand-alone powder X-ray diffractometers - that can operate with power from an AC 100 V outlet. The current models in the MiniFlex Series include a high-power model type with a maximum rated output of 600 W (MiniFlex600), and a reduced-utility model, which requires no water facilities and only generates 300 W of output power (MiniFlex300).

Measurements and results

The MiniFlex300/600 can be equipped with the D/teX Ultra high-speed 1-dimensional detector to obtain greater intensity. This detector energy resolution, so fluorescent X-rays can be removed from the diffraction pattern without using a diffracted beam monochromator. Fig. 1 shows the X-ray diffraction patterns from measuring hematite in the standard energy range (standard mode) and the energy range enabling removal of fluorescent X-rays due to iron (fluorescent X-ray reduction mode).

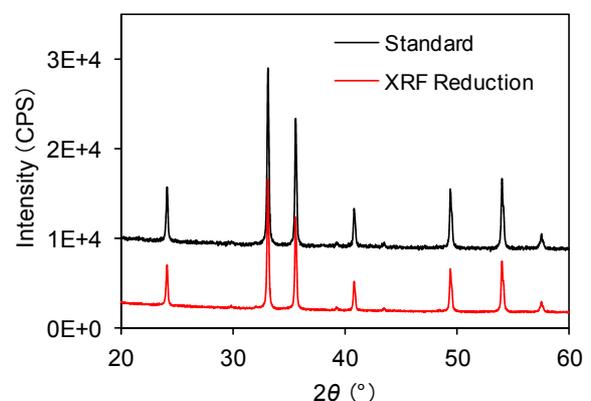


Fig. 1: X-ray diffraction patterns for hematite, measured in standard mode and fluorescent X-ray reduction mode

Fig. 2 shows the X-ray diffraction pattern and qualitative analysis results for iron ore measured using the fluorescent X-ray reduction mode. By using this mode, it is possible to obtain an X-ray diffraction pattern with low background, and thereby detect trace components, even in measurement of Fe-based compounds using a Cu source.

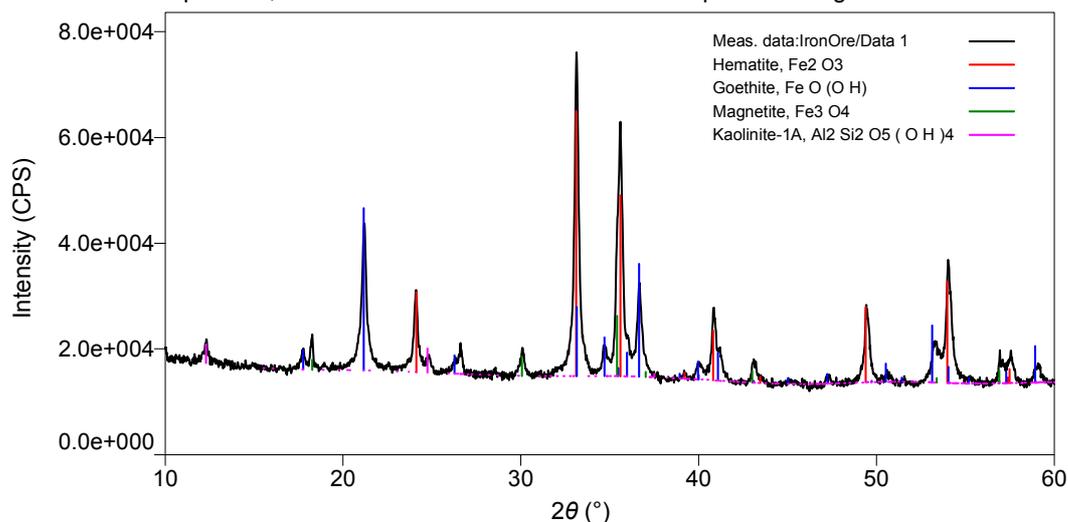


Fig. 2: Results of qualitative analysis of iron ore

Apparatus and Measurement conditions

Apparatus conditions: MiniFlex600 (F.F tube 40 kV 15mA), Detector: D/teX Ultra, Slit conditions: DS = 1.25°, SS = 8 mm, RS = 13mm, Incident side and receiving side Soller slit: 5°, Incident height limiting slit = 10 mm

Measurement conditions: Scan range: $2\theta = 10 \sim 60^\circ$, Step width: 0.02°, Scan speed: 20° / min. (about 3 min.)