Benchtop X-ray diffractometer enabling use with HyPix-400 MF two-dimensional detector

MiniFlex

Achieves 2D measurement with a benchtop unit

1. Introduction

The MiniFlex series has a 40-year legacy, and the MiniFlex benchtop X-ray diffractometer presented here is the latest model of this series. It is now possible to use MiniFlex with the HyPix 2D detector, an option previously available only for high-end models. This is a benchtop X-ray diffractometer, yet it still enables easy 2D measurement.

2. Features of MiniFlex enabling use with HyPix-400 MF

2.1. Scatter protector

Previously, a variable knife-edge provided directly above the sample has been used to reduce background, but use of a scatter protector newly developed for 2D measurement makes it possible to reduce background during 2D measurement and secure space for the sample area. This enables combination with options such as a temperature control attachment, an air-sensitive sample holder, and an 8-sample changer (ASC-8) with a greater number of measurement samples than before.

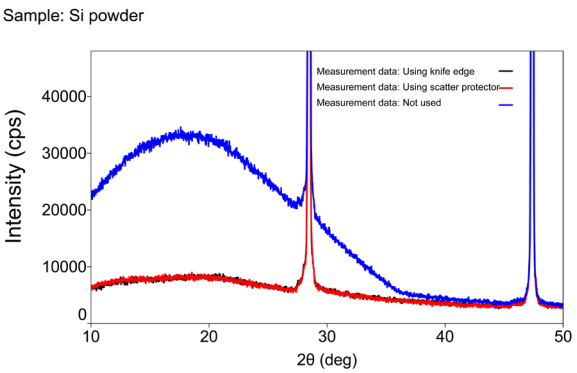

Fig. 1. Effectiveness of scatter protector.

2.2. D/teX Ultra2

The D/teX Ultra2 high-speed 1D detector, previously an option, has become standard equipment. This enables a major reduction in measurement time, and facilitates gathering of data on high-intensity diffracted X-rays. In addition, by using a counter monochromator specially for 0D measurement, it is also possible to carry out low-background measurement the same as a scintillation counter equipped with a conventional monochromator.

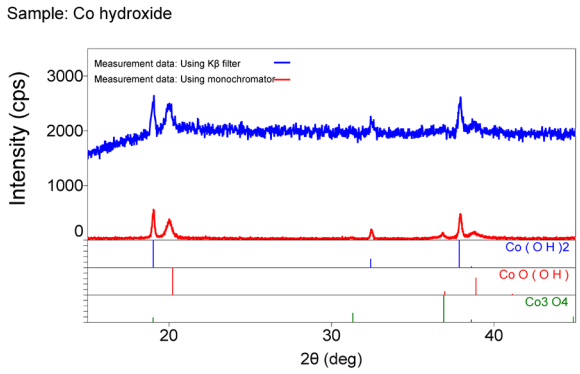

Fig. 2. Effectiveness of detector monochromator specially for 0D measurement.

2.3. 2D measurement using HyPix-400 MF

2D measurement can be easily performed by using, as the optical system, a Kβ filter and 2D slit on the incident side, and the receiving Soller slit OPEN and 2D detector HyPix-400 MF on the receiving side. By using the 2D slit, it is possible to obtain Debye–Scherrer rings with better symmetry that suppress the spread of peaks.

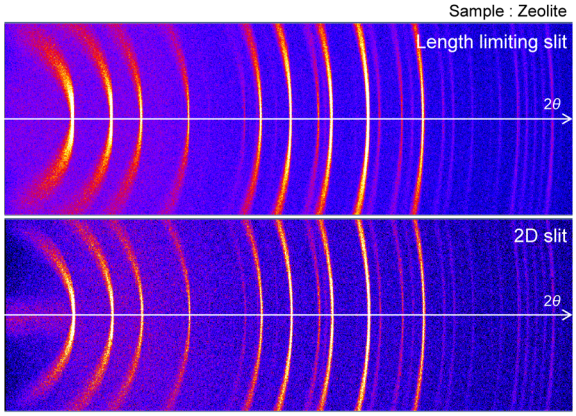

Fig. 3. Effectiveness of 2D slit.
(Top: Using conventional length limiting slit, Bottom: Using 2D slit)

Also, it is possible to confirm features, such as differences in granularity of powder samples and the nature of orientation, which are difficult with a 0D or 1D detector.

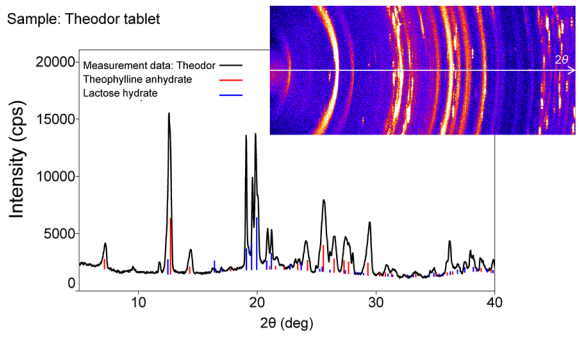

Fig. 4. Results of measuring pharmaceutical tablet.

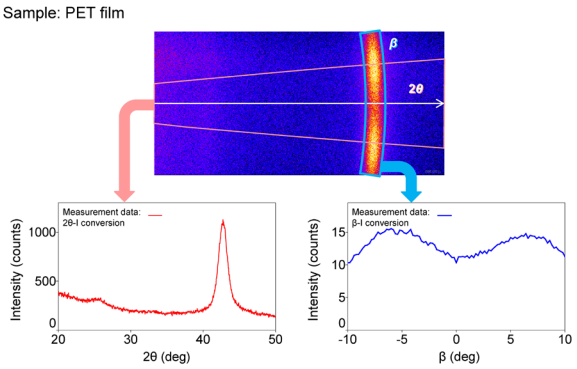

Fig. 5. Transmission measurement results of PET film.

Furthermore, with the HyPix-400 MF 2D detector, software makes it easy to switch between 2D and 1D measurement without replacing the detector.

2.4 Selection of panel color

Accompanying the change in panel design, seven panel colors have been added in addition to the standard color, and it is now possible to select from a total of 8 colors. Users can select their preferred color to match the corporate color, or the location where the equipment is installed.

Fig. 6. Panel colors (total of 8 colors).