

Sample Holder

D2 PHASER

LYNXEYE

Application Report XRD 6

D2 PHASER Desktop XRD: Phase Identification of Geological Material

The D2 PHASER is a portable desktop XRD instrument for research and quality control. It is easy to operate and independent of external media such as cooling circuits. Thanks to the LYNXEYE detector it is the fastest desktop XRD system on the market. This report demonstrates its use for fast and reliable phase identification.

Tab. 1: Experimental settings.

D2 PHASER, LYNXEYE detector
Cu radiation (30 kV, 10 mA), Ni filter
Continuous scan from 3.0 to 55.0° 2Theta Step width 0.02° Counting time 1 sec per step
Total scan time about 45 min.
2.5° Soller collimators, 0.6 mm divergence slit, anti-scatter screen
LYNXEYE detector opening 5° 2Theta

X-ray powder diffraction is a fast method for determining the phase content of polycrystalline material. Every material exhibits a typical 'X-ray fingerprint', which is stored in databases such as the ICDD PDF2 or PDF4. This fingerprint is utilized in the DIFFRAC.EVA software for phase identification. Furthermore, automatic scaling of the patterns from the database relative to the measured intensities gives the semi-quantitative phase composition.

Pulverized geological material was measured with the D2 PHASER. Experimental details are summarized in Table 1. Figure 1 shows a zoomed region (intensities are cut at about 10% of the maximum intensity) of the diffraction data together with the result of the phase identification. The data, collected within 45 minutes, show a very good counting statistics. Minor phases of less than 1 wght-% are clearly identified.

Using the D2 PHASER the value of the investigated geological sample for use in building materials could immediately be shown.

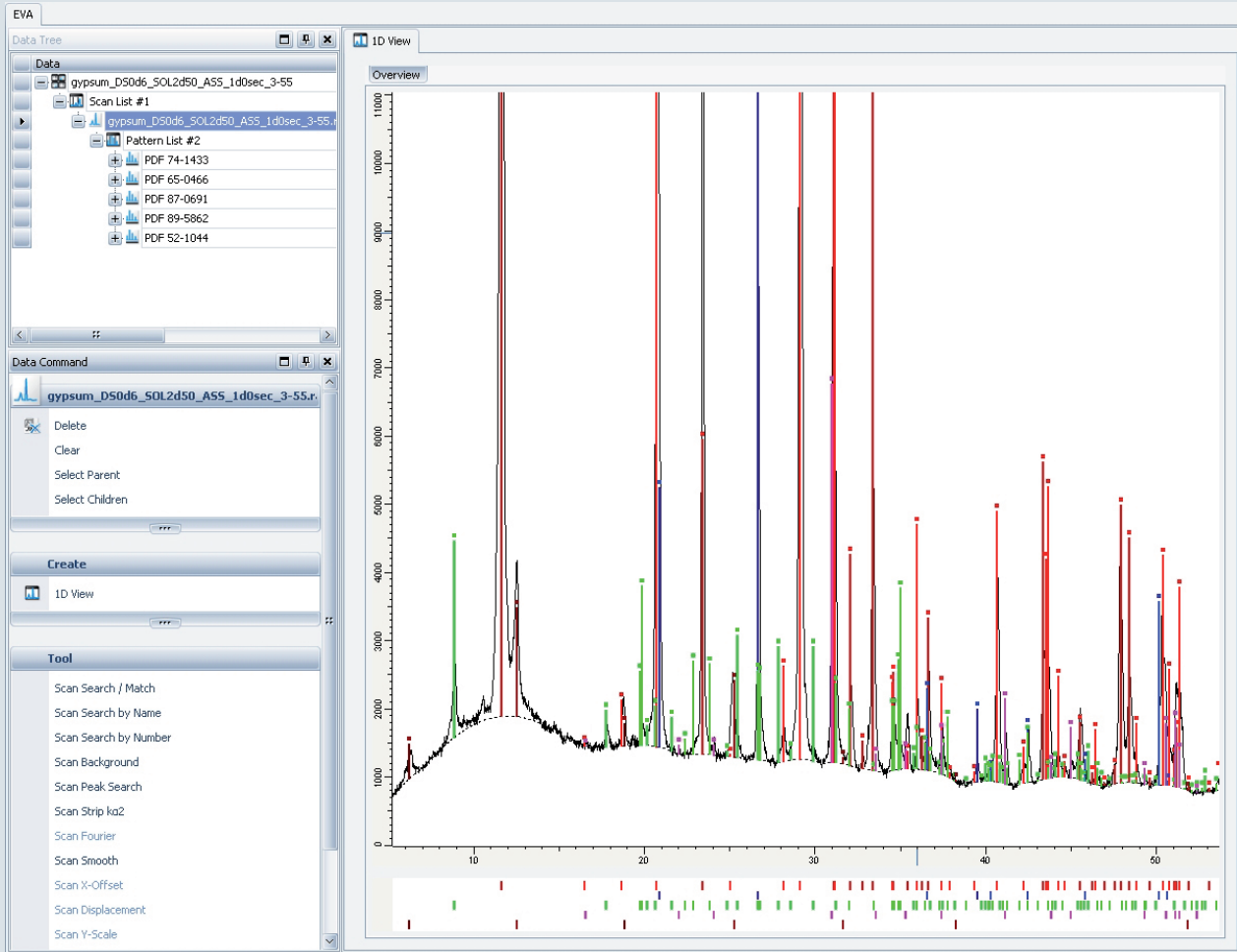


Fig. 1: Phase identification of geological material with DIFFRAC.EVA. The major phase is gypsum. Semi-quantitative phase analysis gives the content of the minor phases: quartz (7.2%), muscovite (0.9%), dolomite (2.1%), and chlorite (1.0%).

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