The Application of Hand-held Rare Earth rapid Identification Instrument in the Quantitative of Rare Earth Elements in Bastnasite accompanied with Barite

Qu Huayang ¹,², Liao Xueliang ¹, Man dongze ², Yuan liangjing ¹,²

(1. China Central Iron and Steel Research Institute (CISRI), Beijing, China; 2. NCS Testing Technology CO., LTD., Beijing, China)

Abstract: Rare earth is regarded as “industrial gold” and has been widely used in luminescent materials, metallurgical products, energy and environment fields. It can enhance the performance of other functional material to produce new advanced material. In order to meet the needs of rare earth ore searching, portable rare earth rapid identification instrument (PORT–X300, NCS testing technology co., LTD.) appeases. Hand-held rare earth rapid identification instrument is a promising candidate for rare earth identification, mineral exploration and products inspection due to its advantages of convenient carrying, accurate identification, fast detection and simple operation. Compared to the unwieldy and inconvenient exploration equipment, rare earth rapid identification instrument is more targeted for exploration of rare earth ore and can be more effectively tailored to individual requirements in the mine.

Based on the principle of energy dispersion-X ray fluorescence spectrometer, rare earth rapid identification instrument can achieve rapid identification of rare earth elements, quantitative analysis of single rare earth elements and total rare earth detection in rare earth ore, such as bastnasite, monaziate and xenotime. Ba occupy a forward position to La in the periodic table, rare earth identification will be disturbed by Ba inevitably. The rare earth ore mingled with high content of barite (BaSO4) will lead to erroneous results by the strong interference of Ba. In this paper, La, Ce, Pr, Nd, Sm, Eu, Gd, Y and total rare earth are quantitatively analyzed via the built-in software calibrated by realistic samples.

Rare earth ore with high content of barite can be accurately analyzed in-place by rare earth rapid identification instrument. The results are of good accuracy and reproducibility, which indicates this hand-held XRF can meet the need of working environment in mine.
Keywords: hand-held; rare earth ore; Energy dispersive X-ray fluorescence spectrometer; bastnasite