

A Study on Mineralogical Characteristics of Pinghe Graphite Deposit in Nanjiang County, Sichuan Province, China

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Abstract: The Pinghe graphite deposit in Nanjiang County, Sichuan Province is a typical sedimentary metamorphic type graphite deposit which contains crystalline graphite and microcrystalline graphite. In this paper, XRD, XRF, Laser Raman spectrometry and optical microscope were used to study chemical compositions, and mineral components of graphite ores, and mineralogical characteristics including crystal structure property and spectral characteristics of the graphite. The results show that the graphite ores are mainly composed of Si, C, O, Fe, Al, and K elements, with 11.73%–56.21% of carbon and 40.33%–79.36% of ash. Besides graphite, the graphite ores contain a certain amount of quartz and a small amount of muscovite, chlorite, and pyrite. The graphitization degrees of samples from the No.9 orebody ($r = 0.6713 \sim 0.9717$) are generally higher than those of samples from the No.7 orebody ($r = 0.7927 \sim 0.9113$). The characteristic diffraction peaks of 2H type graphites are observed in ore samples from both the No.7 and No.9 orebodies. In addition, the graphite from ores of the deposit is mainly 2H type graphite with a certain amount of 3R type graphite. The crystal cell parameters of the graphite vary from 0.2458 nm to 0.2470 nm, and its crystal cell volumes vary from 0.0352 nm³ to 0.0355 nm³.

Keywords: The Pinghe graphite deposit in Nanjiang County; Graphite ore; Chemical composition; crystal structure