

Geochemical characteristics of rare earth elements in Ge-bearing coals from Datianhe Coal Mine, Lincang County, Yunnan Province, China

XIONG Shu-bin, LI Yang-hao, QU Liang, ZHAO Hu, ZHANG Yong-quan, ZENG Gang

(209 Geological Team of Yunnan Nuclear Industry, Kunming 650032, China)

Abstract: The Lincang area of Yunnan Province is an important district of germanium resource in China. The Datianhe coal mine was founded in recent years that it has good potential of germanium resources. A systematic comparative study on geochemical characteristics of rare earth elements of Ge-bearing coal, muddy and sandy fine conglomerate, and biotite monzogranite, which are mainly exposed in the Datianhe coalfield, has been carried out in this paper. The results show that REE distribution patterns of samples from the deposit are characterized with enriched LREE right-declined REE patterns, obvious negative Eu anomalies, and very weak Ce anomalies. Especially, REE patterns of the Ge-bearing coal and the muddy and sandy fine conglomerate are quite similar to those of the Triassic biotite monzogranite. The Σ REE contents and δ Eu values of samples are gradually reduced from biotite monzogranite, muddy and sandy fine conglomerate, to Ge-bearing coals. In addition, the Ge-bearing coals have a close relationship with Triassic biotite monzogranite, but very limited relationship with the adjacent Permian biotite granite in the Σ REE- δ Eu and Σ REE- δ Ce plots. Combining with the geological characteristics of the deposit, it is suggested that the REE of the Ge-bearing coals and the muddy and sandy fine conglomerate could be inherited from that of Triassic biotite monzonitic granite. The Ge of the Ge-bearing coals could be mainly derived from the Triassic monzonitic granite, enriched by the hydrothermal activity of the Triassic magma, and deposited in a relative reduced environment.

Keywords: Datianhe Ge-bearing coalfield; Ge-bearing coal; muddy and sandy fine conglomerate; biotite monzonitic granite; Rare Earth Elements (REE)