

Reflectance and Carbon Isotopes of Kerogen in Lower Cambrian Black Rock Series of Zunyi and Zhangjiajie, China: Indicators to the Source of Au-Ag-PGEs

¹LI, SHENGRONG, ²GAO, ZHENMIN ¹China University of Geosciences, Beijing, China; ²Institute of Geochemistry, Academia Sinica, Guiyang, China.

The Proterozoic and Cambrian ultramafic magmatism in Guizhou province is much more developed than that in Hunan province. Correspondently, the concentrations of Au, Ag and platinum group elements (NMEs) in the Lower Cambrian black rock series are also much higher in Zunyi of Guizhou province than that in Zhangjiajie of Hunan province. This leads us to think that the NMEs in the black rock series were originally from the ultramafic magma or the igneous rocks.

Kerogen, the main organic materials in the black rock series, shows as micro-grains of anisotropic bitumen. It is the product of diagenesis. Reflectance of bitumen (R_b) were converted into that of vitrinite (R^o). The R^o_{mean} data are of 2.550 (8) and 2.393 (16) for the metal-rich bed and black shale in Zhangjiajie and the equivalent data are of 3.054 (12) and 3.272 (10) in Zunyi. 3 samples from Zhangjiajie and 4 from Zunyi were analysed for carbon isotopes. The $\delta^{13}\text{C}$ (PDB, ‰) values are of $-31.008 \sim -31.181$ (± 0.2) for kerogen from Zhangjiajie and $-31.723 \sim -33.854$ (± 0.2) from Zunyi. The systematic differences both in R^o and $\delta^{13}\text{C}$ of the kerogen and the correspondent difference in intensity of magmatism in Zhangjiajie and Zunyi further reveals that the magma was not only the source of the NMEs but also affected the diagenetic evolution of the black rock series.