

Geochemistry of Platinum Group Elements in Dashuigou Independent Tellurium Deposit in Sichuan, China

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The Dashuigou independent tellurium deposit, the first one discovered in the world, is located in Shimian county, Sichuan province, China. Its origin has been thought to be mostly related to granite, but what are sources of tellurium and other ore-forming materials remains questioned.

The concentrations of platinum group elements (PGE) and Au in Te ores, massive pyrrhotite associated with Te ores and metamorphic wall rocks in the Dashuigou independent tellurium deposit are analyzed through Te co-precipitation-isotope dilution with ICP-MS. All of samples are rich in Pt and Pd, and have similar PGE pattern, of which Au concentration, C1 chondrite normalized Pd/Ir and Pd/Pt are 1.5 to 648034 ppb, 4.1 to 92.5 and 0.7 to 8.8, respectively. For Te ores, Au concentration, C1 chondrite normalized Pd/Ir and Pd/Pt are 376 to 648034 ppb, 13.5 to 41.5 and 1.9 to 3.7, respectively; for massive pyrrhotites those are 1.5 to 11.6 ppb, 7.2 to 75.8 and 1.5 to 9.2; for dolomite marble those are 3.4 ppb, 4.1 and 8.8; for metamorphic wall rocks those are 22 to 220 ppb, 10.2 to 92.5 and 0.7 to 8.8.

The data of PGE how evidences that some ore-forming elements such as PGE and Au mostly came from metamorphic basic wall rock. Te could be also partly derived from them in combination with Te abundance in metamorphic warlock.