Extremely higher Gallium content of the Xuanwei black shale in the Upper Permian, West Guizhou, China

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The Xuanwei Formation of Upper Permian is widely occurred in western Guizhou, unconformably overlying Emeishan basalt, and mainly consists of black shale. It is ~170 m thick in the Cuyudong village, Weining County, West Guizhou, China, where the samples of black shale and sandy shale analyzed here are collected. The shale mainly consists of SiO_2, 18.9%–44.1%, Al_2O_3, 14.8%–52.8%, Fe_2O_3, 1.0%–41.2%, LOI, 3.2%–21.1%, TiO_2, 1.0%–6.7%, and MgO, 0.2%–2.5%. The content of all other major elements are lower than 1.0%. These show that the black shale had higher contents of Fe_2O_3 and LOI than that of normal shale. The siderites occurred in the black shale with higher contents of Fe_2O_3, which may be from hydrothermal activity on seafloor. The all analyzed shale samples had extremely higher Ga, 47.8 ppm–109.9 ppm (70.5 ppm in average), higher than the industrial mining standard of Ga Resource Industry Standard (China Mineral Resources Reserves Committee, 1987). The total content of rare earth elements (REE) of 9 black shale samples varies from 213 ppm to 1460 ppm, suggested that these black shale was enriched in REE. The shale-normalized REE patterns display both positive and negative Ce anomalies (Ce/Ce* from 0.5 to 1.7), revealing that the Xuanwei shale precipitated under oxic and anoxic conditions. The Rb-Sr chronological diagram of 6 shale samples in the Xuanwei formation shows that the age is 255 Ma ± 12 Ma. Strontium isotopic ratios ($^{87}Sr/^{86}Sr$)t0 range from 0.70635 to 0.70711, suggested that these Xuanwei black shale might be derived from the chemical weathering of Emeishan basalts.

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Geological characteristics and genesis of Dachang Gold Deposit in Qinghai Province, China

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Dachang gold deposit is located in the North Bayan Har orogenic belt, which is an important metallogenic belt in Qinghai province. The deposit is formed during the late stage of regional Indosinian orogenic process and Au-Sb mineralization related closely with the evolution of the Bayan Har Ocean. All gold ore bodies are hosted in the Middle Triassic sandstone interbedded with slate of Bayan Har Mountains Group and controlled by fracture zone strictly. All ore bodies are presented by vein, vein-like and lenticular. Mineralization can be divided into two stages, for example, gold mineralization and antimony mineralization. The depth of gold mineralization is 6.9km and the depth of antimony mineralization is 5.9km, the antimony mineralization is less shallow than the gold mineralization. The ore-forming fluids belong to NaCl-H_2O-CO_2 type characterized by rich CO_2, low-moderate temperature, low salinity, low density and strong reductibility.The characteristics of geology and geochemistry is similar to the standard orogenic deposit, the gold mineralization is the mesozonal orogenic mineralization and the antimony mineralization is the epizonal orogenic mineralization. The ore-forming fluids of Dachang gold deposit were mainly derived from the formation water and mixed with a small amount of the mantle source magmatic water and meteoric water. Fluid immiscibility and existence of organic matter play important role in gold mineralizing processes. As for its geological setting, ore-hosted rock, mineral and element paragenesis, or metallogenic mechanism, the gold deposit is pretty similar to the Muruntau gold deposit and can be contrasted completely [1].

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[1] Drew & Berger (1996) Geology & structural evolution of Muruntar gold deposit in Kyzylkum Desert [J] *Ore Geology Reviews* **11**, 175-196.