

THE IMPORTANCE OF BLACK SHALES IN THE ORIGIN OF TIN-POLYMETALLIC ORES IN THE DACHANG ORE DISTRICT, SOUTH CHINA

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The Dachang ore district, with about 100 millions tons of ore at 1 % Sn, 3-5% Cu-Pb-Zn±Sb and 100ppm Ag is one of the largest tin producers in the world. Sn-deposits are hosted in a sedimentary sequence containing significant portion of the Lower Devonian low and high calcareous black shales and marlstones, that together with the younger granite intrusion actively participated in the formation of Sn-polymetallic deposits.

Field observations coupled with the new petrologic, mineralogical, inorganic and organic geochemical, isotopic and fluid inclusion data from the Dafulou (about 4 mil. t of ore at 1.1 % Sn.), Huile (about 1 mil. t of ore at 1.1% Sn and 1.0% Zn) and Kangma (the upper part of the stockworks till the depth of 250 m with 0.4-0.55 % Sn and deeper part with ore at 0.7-0.8 % of Sn in average.) stratabound and stockwork type cassiterite-sulfide deposits have confirmed that the black shales have played several important roles in their origin.

They became a source of S and partially of Sb, Co, Pb, V, and Fe during depositional period. Black shales have also played an important role controlling remobilized and epigenetic Sn-sulfidic mineralization that occurred in connection with granitoid intrusions. High calcareous facies acted most likely as a geochemical barrier for metal-rich hydrothermal solutions that precipitated minerals in zones of lithologically and structurally controlled permeability. It was also shown that black shales were a dominant source of sedimentary sulfur for ore sulfides and that oxidized organic matter have played a major function in the origin of ore-bearing and post-ore carbonates.