

The relationship between mineralization of some metals and accumulation of oil & gas in eastern GUIZHOU, CHINA*

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Some Formations of Lower Paleozoic such as Qinxudong, Aoxi, Yangjiawan in eastern Guizhou are container rocks for not only Hg, Sb, Au, Pb and Zn but also oil & gas. There are affinities between them.

The occurrence of metals and paleo-oil deposit (asphalt) is same as in cracks, holes and crystal interstice of limestone and dolomite. Vertically, asphalt is above paleowater-oil interface, and metals deposit below the surface.

Brown hydrocarbon inclusions are found in blende of Qingxudong Formation in Niujiatong Mine. Hg content is higher at $3 \times 10^{-6} \sim 736 \times 10^{-6}$ in pitch of Aoxi Formation in Tongren paleo-oil deposit. Au content of pitch is also higher at 220×10^{-10} in Wuhe. These volume are hundreds to thousands times as CLARKE. But Zn content of pitch is only $3.8 \times 10^{-6} \sim 73 \times 10^{-6}$ (on average of 22.6×10^{-6}) in Tongren, Danzhai and Majiang, near the evenness in carbonate rock (20×10^{-6}). Consequently, Hg, Sb and Au but Pb and Zn were suggested migrated together with oil and gas.

The main oil source rocks of Lower Cambrian such as Jiumenchong Formation, Zhalagou Formation and Muchang Formation, have a high volume of Hg, Sb, As, Pb and Au, but with a low volume of Zn.

The new study indicates that source rock of Lower Cambrian generate hydrocarbon from Early Ordovician to Early Triassic. Inclusions in calcite which accrete with Hg-minerals have homogenization temperatures with $103 \sim 183^\circ\text{C}$ in Tongren and $95 \sim 166^\circ\text{C}$ in Danzhai. The composition of inclusion involves methane and heavy hydrocarbon. Hydrocarbon evolution is in wet gas period while Hg mineralization. So the era of Hg generation should be from Middle to Late Triassic.

Some metals often symbiosis with paleo-oil deposit in Guizhou and Guangxi. The research is important for ore geology and petroleum geology.

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