

Dating the oldest oil reservoir in China: Implications from SHRIMP zircon U-Pb ages

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The Mesoproterozoic Eon(1600~1000Ma) is emerging as a key biogeochemical interval in Earth history but is rather poorly understood in its hydrocarbon potential. 31 solid bitumen spots coexisting with igneous rocks were newly discovered in the bottom sandstones of Xiamaling Formation, North China Block. Previous geochemical studies presented relatively controversial constrains on age of gabbro-dabase intrusions, leaving accumulation time of ancient oil pool less known. We suggest strong anisotropy of collected solid bitumens as direct evidence of anomaly thermal alternation caused by igneous rocks. By means of SHRIMP (sensitive high-resolution ion microprobe) Zircon U-Pb dating, we present new age data on two gabbro-dabase rock samples situated in vicinity of solid bitumens. It yielded an average age of 1327 ± 2 Ma. The point-contact between quartz granules in sandstones indicate the oil had charged into reservoir at a very early stage of diagenesis. Newly SHRIMP U-Pb dating work shows the Xiamaling Formation began to deposit since 1400Ma^[1]. Our results constrain the accumulation time of oil reservoirs in Xiamaling Formation between 1400~1327Ma, indicating that the solid bitumens discovered in Xiamaling Formation was an original oil pool developed during Mesoproterozoic Eon, which was proved to be the oldest oil reservoir in China.

[1] Li Huaikun *et al.* (2009), *Geological Bulletin of China*, 28(10):1396-1404.