

## Study on ore-forming materials source of bauxite in northern Guizhou province, China

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Northern Guizhou bauxite occurred in the Carboniferous Huanglong Group (C<sub>2</sub>h) or Silurian hanjiadian group (S<sub>1,2</sub>hj) above the Permian Liangshan Formation (P<sub>2</sub>l), were unconformable contact. Studies suggested that the source of ore-forming materials was from hanjiadian group.

Zircons from the bauxite were mainly magmatic zircon. There were sedimentary and metamorphic zircons. Thick zirconia stones had good roundness with a small amount of irregular shape. Smaller zirconia stones mostly were semi-euhedral and euhedral. The age of U-Pb zircon was 400-2400Ma. Minimum age corresponds with the mineralization. The peak age ranges of the different bauxite deposits were basically the same.  $\delta_{34}$  sulfur isotopic composition were between -29.20 ‰ ~ +12.40 ‰, belonging to the scope of sulfur isotopic composition of sedimentary rocks, with characteristics of biogenic pyrite.

Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, FeO and TiO<sub>2</sub> from diaspore were negative correlation. There existed an obvious process of desilicization, iron removal and dissolving titanium. Sandstones and shales of Hanjiadian group (S<sub>1,2</sub>hj) were rich SiO<sub>2</sub> (37.39 ~ 65.75%), high Al<sub>2</sub>O<sub>3</sub> (14.14 ~ 31.77%). The SiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> content of Dolomitic limestone from Huanglong Group (C<sub>2</sub>h) were only 1.37 ~ 1.85% and 0.54 ~ 0.61% respectively.

Enrichment and dilution characteristics of trace elements from bauxite layer were similar to hanjiadian group, mainly enriched Sn, Mo, Bi, Be, Ta, Nb and other elements. REE levels were relatively high, is several ~ few hundred times than dolomitic limestone from Huanglong group.

The studies have shown that ore-forming materials derived from ancient efflorescence, with transport and deposition mineralization. The contribution of sandstone and shale from Silurian hanjiadian group (S<sub>1,2</sub>hj) for bauxite were positive.

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## Characteristics of source rocks and hydrocarbon generation in Yacheng area of western Qiongdongnan basin, northern South China Sea

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Yacheng area, famous for YC13-1 gas field, is the most important hydrocarbon accumulation area of Qiongdongnan basin, a petroliferous Tertiary extensional basin in the northern South China Sea. There are three series of source rocks in Yacheng area, including lake facies of Eocene, littoral-neritic facies and marsh facies or coastal plain facies of Oligocene and sea facies of Miocene. All these source rocks are mainly distributed in Yanan sag and Yabei sag. Among them, Oligocene source rocks (mainly consist of intercalated coal seam, carbonaceous mudstone and dark mudstone) with II<sub>2</sub>~III kerogen and good quality become the major source rocks in this study area. Most oil and gas is from Yanan sag, which is the primary hydrocarbon supplying area in Yacheng area with its excellent source rocks, and some other hydrocarbon is from Yabei sag, Yinggehai basin and Ledong sag. According to the geologic agents and geochemical characteristics of hydrocarbon accumulation, types of biogas and bio-less matured transitional gas, normal matured and high-over matured thermal mechanism oil/gas are identified in Yacheng area [1]. Among them, the normal matured thermal mechanism oil/gas is the dominant type. Moreover, hydrocarbon accumulation of YC13-1 gas field is characterized by bidirectional filling and mixed sources. Most of its oil/gas is from Yanan sag, and the north of gas field is effected by Yinggehai basin mainly. Furthermore, hydrocarbon of Yanan sag has migrated into Yacheng uplift successfully, that shows Yacheng uplift is one of the favorable areas for hydrocarbon migration and petroleum exploration.

[1] He *et al.* (2002) *Offshore Oil* 1, 47-56.