

Geochemical implications for the genesis of Algoma type banded iron formation in Yishui county, western Shandong Province, China

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The Yishui BIFs (Banded Iron Formation) are located in Taishan Group, Yishui county of Western Shandong Province of North China Craton (NCC). Iron ores of Yishui BIFs were characterized by REY (REE+Y) and trace element analyses and were compared to other BIFs in NCC. Then Yishui BIFs were examined in their geochemical characteristics combined with geological tectonic model. The iron ore samples were collected from the mine pits. Major elements were analyzed by X-ray Fluorescence Spectrometry (XRF) and trace elements and REE were analyzed by Inductively Coupled Plasma Mass Spectrometer (ICP-MS). The iron ores of Yishui BIFs are mainly composed of SiO_2 and Fe_2O_3^T (85.8 to 98.8 wt%) and have low Al_2O_3 , CaO and TiO_2 contents. Yishui iron ores are plotted within the field of Precambrian BIFs of Govett's triangular diagram. The trend of major element of iron ores of Yishui BIFs is similar to that of typical Archean BIFs in China. The REY patterns of BIF at Yishui show positive La, Gd anomalies and slightly negative Ce anomalies, showing enriched HREE and depleted LREE patterns. Yishui iron ores have distinct positive Y anomalies except one sample which shows slightly negative value. These REY Characteristics suggest that BIFs were formed in both anoxic and suboxic conditions, and were influenced by mixing of seawater and hydrothermal fluids. Yishui BIF are emplaced in the Eastern part of the NCC. Mantle plume model can explain the tectonic setting of Eastern blocks and the source of iron and silica in Yishui BIFs.