

東エジプト, エルダバア地域における 7 億年前の縞状鉄鉱層の地球化学的特徴

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Geochemical characteristics of banded iron formation of 0.7Ga in El Dabbah, Eastern Egypt

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In the Eastern Desert of Egypt, Neoproterozoic banded iron formations are reported within Arabian-Nubian greenstone belts (El-Gaby et al., 1990, Stern et al., 2011) whose deposition field has not been studied in detail. We established the geological structure to reconstruct the stratigraphy of banded iron formation (BIF) in the El Dabbah area, which is lower and less deformed within the greenstone area, and revealed characteristics of BIF by microscopic observation and chemical analysis.

Four domains of blocks were subdivided in the El Dabbah area. In the southeastern block of the El Dabbah area, coarse-grained volcanoclastic rocks, pillow lavas, several thin black shales and BIFs formed alternating layers. The total thickness of this sequence is at least 4000m. Black shales and BIFs are repeated at least three times in volcanoclastic rock layers. Volcanoclastic rocks are poor in quartz and rich in plagioclase. BIF sequences are sandwiched between massive and pillow lava sections and repeatedly preserved. Most BIFs occur within laminated green shale and black shale sequences. The layer thickness gets thinner towards the top of the stratigraphy. REE analyses of BIFs are rich in light rare-earth elements and show negative Eu anomalies. In addition, volcanoclastic rocks are rich in large ion lithophile elements and poor in high field strength elements. These facts indicate that the greenstone was deposited in arc setting.

The BIFs have been deposited with the black shales and fine volcanoclastic rocks during the quiescent state of the interval of volcanic activity. Iron formations show negative Eu anomalies, suggesting that it was also affected by igneous activity of island arc. We conclude that the precipitation of iron happened repeatedly in between volcanic activities and it was local deposition that changes thickness in between a few kilometers.