

Geochemical characteristics of the Late Devonian to Early Carboniferous cherts from Loei Fold Belt in NE Thailand: implication for geotectonic setting

Hui Sun¹, Qinglai Feng^{1,2,*}, Xin Qian¹

¹ Faculty of Earth, China University of Geosciences, Wuhan 430074

² State Key Laboratory of Geo-processes and Mineral Resources, China University of Geosciences, Wuhan 430074, China

* qinglaifeng@cug.edu.cn

It is widely known that Southeast Asia is composed of several terranes that separated from Gondwana during the geological history. Indochina Block located in the eastern part of Thailand has been rifted from Gondwana since Early Devonian (Metcalf, 2013). In the western margin of Indochina Block, the ocean basement was created as a result of the separation which is evidenced by the existence of both Middle Devonian deep-sea radiolarian-bearing cherts and Late Devonian to Early Carboniferous MORBs and oceanic island-arc lavas (Metcalf, 2002; Panjasawatwong et al., 2006). Several previous studies have been carried on both volcanic and sedimentary rocks in Loei Fold Belt situated to the western of Indochina Block aiming at identifying the regional tectonic evolution. Recently we collected the radiolarian cherts from Loei fold belt and make the chemical analysis in order to identify the depositional regime of the chert and gain more understandings on the tectonic evolution of this area.

Here I present the result of the detailed chemical analysis of cherts located in Loei fold belt, northeast Thailand.

Moderately-preserved Late Devonian to Early Carboniferous radiolarians were extracted from Loei, Pak Chom area, northeast Thailand. Six species were identified from the radiolarian fauna, including *Albaillella paradoxa* Deflandre, *Astroentactinia multispinosa* (Won), *Stimosphaerostylus* sp.D Wang, *Trilonche parapalimbola* Wang, *Spongoentactinella micrococca* Wang, *Helenifore robustum* (Boundy-Sanders et Murchey). The radiolarian-bearing cherts have high SiO₂ (>90 wt.%) contents, various Al₂O₃ (1.61-2.52 wt.%), high Al/(Al+Fe+Mn) ratio(0.82-0.95) and high Si/(Si+Al+Fe) values. The major elements of these chert indicate a biological origin and the sedimentary environment is the continental margin. However, when it comes to the REE of the cherts, a distinct conclusion is drawn. These cherts are characterized by slightly negative NASC-normalized Ce anomalies (average 0.74) and the positive Eu/Eu* (average 1.57). The REE indices show that these radiolarian cherts were influenced by hydrothermal fluids during deposition. According to the geological background, the cherts are in close relationship with the Loei Central volcanic

rocks which mainly consist of tuff, tuffaceous shale/mudstone, basalts and andesites that formed in the same period (Sashida, 1993; Panjasawatwong et al., 2006). Therefore, it is inferred that the depositional environment of the cherts is not the typical continent margin or the pelagic, but a mature bakarc basin. The contemporaneous volcanic rocks are the results of the expansion of back-arc basin.

References

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