Geology and mineralogy of the altered rocks in the Choghart deposit, Bafq area, Central Iran

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The Central Iranian interior plateau is a triangular-shaped region bounded by the Makran and Zagros Ranges in the south and southwest, the Alborz and Kopeh-Dagh Ranges in the north and northwest, and the East Iran Ranges in the east. The study area is centered at 31° 42´ 0´´ E and 55° 28´ 2´´ N on the district magnetic anomaly map.

The Choghart deposit is located in the Bafq area in the Central Iran (a part of Gondwana fragment) and it is exposed in an area between Mishdowan and Kushk and is hosted within a volcaniclastic section of the Cambrian Volcano-Sedimentary Unit. The district comprises a narrow rift zone extending from north to south of tectonically Central Iran zone and is located between Kuh-Banan and Kuh Daviran major fault structures. The Saghand Formation and metallogenesis of Fe-P-REE is related to magmatic events that accompanied major late Precambrian intercontinental rifting process events (Samani and Chen 1992). A sequence of metamorphed clastic, minor intracalastes or carbonate, gchereenshist and basic volcanic lava (locaely metasomatised) as named Natk Formation is located in upper Riphean. This sequence overlain by the Saghand Formation. It is consist of rhyolite, rhyolite tuff, andesite, magnetite, jaspilite, cherty dolomite gypsum beds, limestone and black shale. Main ore bearing member, mostly volcanogenic compositing of agglomerate, breccias, with intercalations of carbonate in upper part, extensively metasedimented, transformed into different metasomatic rocks, hosting Fe, U, Th, REE (>400m.). The field investigation and sampling have done on the rocks bearing apatite-actinolite in the Choghart deposit.

According to the petrography studies the mineral assemblage consist of apatite, carbonate minerals, actinolite, garnet, clinopyroxcene, magnetite and quartz. On the base of the mineral chemistry garnet grains (Ad96.7, Gr1.88) are andradite, clinopyroxene (Di76.14, Hd22.65, Jo1.21) is diopside-hedenbegite and amphibole is actinolite in composition.

Decoding carbon cycle and climatic change by C, O and N isotopes of the Ediacaran carbonate rocks in South China

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The Ediacaran is one of the most important periods in the history of evolving life when multicellular animals firstly appeared on the earth. However, it is still ambiguous the relationship among the abrupt biological evolution and environmental change. We carried out on-land drilling in Three Gorges area, South China to collect fresh, continual samples [1]. We analyzed carbon and oxygen isotopes of the carbonate and carbon isotope of the organic carbon. The $\delta^{13}C_{carb}$ displays five negative anomalies whereas, the $\delta^{13}C_{org}$ displays almost constant value. And the $\delta^{18}O$ shows very high $\delta^{18}O$ values around 0‰ permil in the early Ediacaran

The $\delta^{13}C_{carb}$ profile of this work possesses all of the anomalies in other sections, indicaing that the $\delta^{13}C_{carb}$ profile represents the global oceanic $\delta^{13}C_{carb}$ change in the Ediacaran. The lack of correlation between $\delta^{13}C_{carb}$ and $\delta^{13}C_{org}$ can be explained by the presence of quite large dissolved organic carbon (DOC) reservoir, which conceals the concomitant $\delta^{13}C_{org}$ change with the $\delta^{13}C_{carb}$ change [2]. The large DOC scenario is also supported by steady $\delta^{15}N_{org}$ during the negative $\delta^{13}C_{carb}$ excursion.

The secondary alteration usually causes decrease in both $\delta^{18}O$ and $\delta^{13}C_{carb}$. The occurrence of anticorrelation between them and the high $\delta^{18}O$ values suggest the drill core samples still preserve the primary signature. There is a large positive excursion of $\delta^{18}O$ with large negative excursion of $\delta^{13}C_{carb}$ and geological evidence for eustatic sea-level falling in the middle Ediacaran. The presence of positive excursion of $\delta^{18}O$ indicates the cooling event. This cooling event possibly corresponds to the 580 Ma Gaskiers glaciation [3].

[1] Ishikawa *et al*. (2008) *Gondwana Res* **14**, 193–208, Sawaki *et al*. (2008) *Gondwana Res* **14**, 134–147, Sawaki *et al*. (2010) *Precamb Res* **176**, 46–64 [2] Fike *et al*. (2006) *Nature* **444**, 744–747. [3] Myrow & Kaufman (1999) *Jour Sediment Res* **69**, 784–793.