The indication of metallogeny for the iron deposit in Abagong area in the southern margin of Altay, Xinjiang, China

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Abagong iron deposit is located in late Silurian-early Devonian felsic volcanics along the southern margin of Altay. The deposit occurs as lens, veins and stratoid body controlled by fault structures by volcanism. There are clear definition between iron body and host rocks, not marked alteration in host rocks, high content and coexisting apatite and magnetite in iron ore. Due to above features, we can compare Abagong iron deposit with Kiruna type in northern Sweden and Ningwu porphyrite iron deposits. Trace, rare-earth elements compositions in the apatite from two different locations in Abagong iron deposit were analysed and displayed in this paper. The apatite of Abagong iron ore contains about 1352.96×10^{-6}-6986.33×10^{-6} REE with average 3717.70×10^{-6}; There are LREE enrichment, a weak LREE/HREE fractionation with $(La/Yb)_N$=1.37-9.77 (average value 5.22) and marked nagetive Eu anomalies with Eu/Eu* = -0.78--0. 69 (average value -0.75). This characteristics indicates that Abagong iron ore , the Kiruna type iron ore in Northern Sweden and Porphyrite iron ore in Ningwu area have a common genesis of magmatic differentiation. The apparently similar shape of REE curve between apatite and metamorphic rhyolite and the consistency of variety of trace elements between them both indicate that the mineralization of iron is related to differentiation of granitic magma or ore magma intruding.

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An unique record of ultra-deep subduction and fast exhumation hidden in zircons from marbles and eclogites in the Sulu-Dabie UHP terrane, China

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Laser Raman spectroscopy and cathodoluminescence (CL) images show that zircon from Sulu-Dabie marbles and eclogite lenses in marbles is characterized by distinctive domains of prograde, ultrahigh-pressure (UHP) and retrograde metamorphic growths. The prograde metamorphic domains preserve a quartz eclogite-faceis mineral assemblage of Qtz + Dol + Grt + Omp + Phe + Ap, formed at 542-693°C and 1.7-2.1 GPa. In contrast, the UHP metamorphic domains retain the UHP mineral assemblage of Coe + Grt + Omp + Arg + Mgs + Ap, and record UHP conditions of 739-866°C and >6.0 GPa. The outermost rims contain low-P mineral assemblage of Qtz + Cal + Ab, related to the regional amphibolite-facies retrogression. U-Pb SHRIMP dating on these zoned zircon identified three discrete $^{206}Pb/^{238}U$ age groups: the prograde domains record the quartz eclogite-facies metamorphism at 251-240 Ma with a mean age of 245 ± 4 Ma, the UHP domains occurred at 239-230 Ma with a mean age of 235 ± 3 Ma, and the late amphibolite-facies retrogressive overprint in the outermost rims was restricted to 219-210 Ma with a mean age of 214 ± 5 Ma. The P-T conditions and mean ages of these zones suggest that subduction the Yangtze craton to UHP depths took place over 10 Ma and exhumation of the rocks occurred over a period of 21 Ma. Thus, subduction of from ~ 55 km to > 200 km deep mantle depth took place at rates of approximately 14.5 km/Ma and exhumation from depths >200 km to the base of the crust at ~30 km occurred at approximately 8.1 km/Ma, and these rapid subduction-exhumation rates may explain the obtained P-T-t path for the Sulu-Dabie UHP terrane. A new model has been proposed for these rocks in the Sulu-Dabie UHP terrane involving ultra-deep subduction of continental margin lithosphere followed by ultra-fast exhumation driven by buoyancy forces after break-off of the UHP slab deep within the mantle.