

Mineralogical and geochemical (U-Pb and Ar-Ar ages and trace elements) characteristics of Bargilt Fe deposit in Eastern Mongolia

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Bargilt Fe deposit is located in Darkhan Sum of Khentii province in eastern Mongolia, 330 km southeast away from Ulaanbaatar. The main host rock is granite and diorite gneiss intruded by granite and rhyolite intrusive complex. In previous studies, the metamorphic and intrusive events seemed to occur in Neoproterozoic and Paleozoic-Mesozoic period, respectively. However, here we report new zircon U-Pb age data with muscovite Ar-Ar age and trace elements geochemistry, which can be helpful to understand the origin and formation of the Bargilt Fe deposit.

Zircon U-Pb age of host rocks and intrusive complex show that several intrusive activities occurred in both Cambrian and late Permian to early Triassic period. With the muscovite Ar-Ar age of skarn alteration zone (late Triassic) and mineralogical observation, the late Permian to early Triassic intrusion is considered to related to a widespread hydrothermal alteration, triggering skarn mineralization in the study area. Major and trace elements compositions of magnetite, major ore mineral, imply that hydrothermal skarn alteration acts as a major mineralization process in the study area. The magnetite equilibrium temperature (T_{Mg-mag}) indicates that the ore-forming fluid of the Bargilt Fe deposit might be evolved from high-temperature magmatic-hydrothermal fluid.