

## Study of apatite and iron geochemistry and mineralization for identification of the rare earth elements deposit, Gazestan in Bafgh region (Yazd Province)

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**Abstract:** Gazestan deposit is located about 185 km of Yazd, in the Bafgh – Posht e Badam Metallogenic belt, consists of Infracambrian carbonate, shale, tuff, sandstone and volcanic rocks. Acid to basic green rocks (rhyolite, dacite and basalt) are host for iron and phosphate mineralization. The alteration process is more intense in the volcanic rocks including, actinolite, chloritization, silicification and argillic. Also the host rocks altered strongly. Mineralization contains iron oxides and apatite associated with a minor amount of quartz, pyrite and calcite. The form of magnetite - apatite in the altered host rocks, magnetite - pyrite apatite, silica bearing magnetite, hematite and hematite magnetite ores. Also high LREE / HREE ratio and Eu negative anomaly could be indicative of a magmatic source. Therefore, origin of the Gazestan iron ore deposit is similar to Sweden Kiruna type.

**Keyword:** *iron and apatite; rare earth elements; Bafgh Gazestan; Bafgh – Posht e Badam metallogenic belt.*

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