Study of rare earth elements in fire clay deposites in the north of the Fars province(Iran) .

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The area of this study is located in part of ShahReza-Abadeh-Hambast horstic belt. This belt is consists of many Iranian clay deposits(including Abadeh deposits). fire clay layers of the area are placed within a sequence of Upper Devonian shale and sandstone to Carbonifer and Permian periods.

This study was conducted in two stages:

(i)Perospecting (ii) semi-detailed

In the semi-detailed (ii) studies were conducted on fire clays with the highest percent of AL, because REE in these samples have had highest persent.

Original nature of pyrophillitic clays (pyrophillitic schist) in north of the Fars province are volcanic rocks to the deep half.

In parts of the Esteghlal-e- Abadeh Mine trachyandesite to be out crop, which have different phases of alteration from Devonian to the present day occured .

The alteration and weathering of rocks are developing in these minerals like : Pyrophillite, kaolinite, illite, muscovite ,rutile, titanite, carbonates, hematite and lesser amounts of chlorite and gypsum in a variety of fire clay types ranging from white to dark gray, brown and lemon.

Pyrophillitization of volcanic rocks were the cause of enrichment of REE in the fire clay of area. between LREE and HREE, LREE show more enrichment.

The correlation coefficient between the elements shows AL-bearing minerals (Pyrophillite and kaolinite) and clay minerals, especially potassium type (illite) and muscovite ,rutile, titanite are mostly and gypsum and chlorite are least likely to host REE in the area. A drawing of Fe + Ti vs. Cr + Nb suggests supergene provenance of area deposit.

Fire clay quality in terms of higher AL and lower Fe and other impurities from the Devonian to the Carbonifer and Permian were decreases.Due to lower aluminum ,concentration of REE especially LREE in rocks of this period have decreased.