Mineralogy, geochemistry and genesis of titanium-rich placer in khanik deposit, urmia, west Azarbaijan province, NW Iran

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Abstract

The Khanik titanium placer deposit is located at 82 km northwest of Urmia city in the Sanandaj-Sirjan structural zone. This deposit is a part of Qazan mafic-ultramafic intrusive complex which have two types of mineralization including, 1) magmatic ilmenite and 2) sedimentary type of alluvial placer. The major minerals of placer is composed of ilmenite, titanomagnetite, magnetite, hematite, albite, hornblende and its minor minerals include augite, clinozoisite, actinolite, goethite, montmorillonite and forsterite. Microscopic studies of placer samples show the ilmenite as of individual grains and lamella inside the magnetite. The chemical composition of placer samples represent at diagrams of Al_2O_3/TiO_2 *vs* SiO_2 and (Hf/Yb)×10 *vs* La/Th indicates the protolith is belong to igneous mafic rocks. The REEs distribution, normalized in respect to chondrite shows lower distribution of LREEs in respet to HREEs with low negative anomaly of Eu implying a mafic source rock in the area. Ni/Co, Cu/Zn and U/Th indexes represents oxidizing environment at the time of deposit formation. Chemical weathering index (CIW') also indicates a high degree of weathering processes during the development of this placer.

Keywords: titanium, placer deposits, Ilmenite, Chemical weathering index (CIW'), khanik, Urmia.