



Aluminous A-type granite of Takhte Baz area (NW of Birjand, East of Iran) and its tectonic significance

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Takhte baz granitoid in northwest of Birjand is located in north part of sisthan suture zone in east of Iran. It has engulfed with andesitic rocks, pyroclastic units composed of tuff, marly tuff and breccia tuff. Petrography and major elements analysis show that this body is alkali granite to syenogranite. Main textures in these rocks are granular, graphic, myrmekite and granophyric, which show this body has cooled in relatively shallow depth. Alkali feldspars (perthite), quartz, sodic plagioclase are essential minerals. Biotite is the unique mafic mineral in these rocks. Zircon, sphene and Fe – oxide are accessory minerals. Present pink colour alkali feldspar in this body is an indicator of oxidation condition for crystallization. Biotite and feldspars have altered to chlorite, sericite, calcium carbonate and clay minerals. Chemically, the rock suite is characterized by high SiO₂, Fe/Mg, total alkali (K₂O, Na₂O), Zr, Hf, Ga/Al, and REE except for Eu. Negative anomaly for Eu indicates an important role for plagioclase during fractional crystallization. Low contents of MgO, CaO, P₂O₅, Sr and Ba is another character. These features along with various geochemical discriminant diagrams suggest that the Takhte baz granitoid is post-collisional A-type granitoid (A2-type). This displays ferrous, peraluminous with minor of peralkaline nature. It has derived from melting of continental crust in an extensional system after collision of Lut and Afgan continental block in east of Iran. Based on the field evidences, two different phases have distinguished in Takhte baz. The main phase has light pink color and the minor phase which is as enclaves in main phase, has grey color. Age dating with zircon uranium – lead method determined that main phase is 55.7 ± 0.6 Ma and minor phase is 56.5 ± 0.5 Ma (early Eocene).