World Academy of Science, Engineering and Technology
International Journal of Geological and Environmental Engineering
Vol:13, No:06, 2019

Geochemistry and Petrogenesis of Anorogenic Acid Plutonic Rocks of Khanak and Devsar of Southwestern Haryana

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Abstract : Acid plutonic rocks from the Khanak and Devsar areas of southwestern Haryana were investigated to understand their geochemical and petrogenetic characteristics and tectonic environments. Three dominant rock types (grey, grayish green and pink granites) are the principal geochemical features of Khanak and Devsar areas which reflect the dependencies of their composition on varied geological environment during the anorogenic magmatism. These rocks are enriched in SiO_2, Na_2O+K_2O, Fe/Mg, Rb, Zr, Y, Th, U, REE (Rare Earth Elements) enriched and depleted in MgO, CaO, Sr, P, Ti, Ni, Cr, V and Eu and exhibit a clear affinity to the within-plate granites that were emplaced in an extensional tectonic environment. Chondrite-normalized REE patterns show enriched LREE (Light Rare Earth Elements), moderate to strong negative Eu anomalies and flat heavy REE and grey and grayish green is different from pink granite which is enriched by Rb, Ga, Nb, Th, U, Y and HREE (Heavy Rare Earth Elements) concentrations. The composition of parental magma of both areas corresponds to mafic source contaminated with crustal materials. Petrogenetic modelling suggest that the acid plutonic rocks might have been generated from a basaltic source by partial melting (15-25%) leaving a residue with 35% plagioclase, 25% alkali feldspar, 25% quartz, 7% orthopyroxene, 5% biotite and 3% hornblende. Granites from both areas might be formed from different sources with different degree of melting for grey, grayish green and pink granites.

Keywords : A-type granite, anorogenic, Malani igneous suite, Khanak and Devsar
Conference Title : ICPVG 2019 : International Conference on Petrology, Volcanology and Geochemistry
Conference Location : New York, United States
Conference Dates : June 04-05, 2019