Petrographic evidences and geochemical criteria of restite in the Shir-kuh anatctic granite, SW Yazd

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Abstract: The S-type granitoidic batholith of Shir-Kuh consists of three main granodioritic, monzogranitic and leucogranitic units. The separation of restite crystals from the primary melt, followed by the fractional crystallization, appears to have been an effective differentiation process in the batholith. Small biotite assemblages with higher $X_{Mg}$ relative to host flaky biotites, surmicaceous enclaves, the biotite cored by sillimanite, the calcic cores of plagioclase, refractory metasedimentary enclaves and cordierite containing less than 0.5wt% Na$_2$O are the main putative restites which are widespread in more mafic rocks of the batholith. In addition, inherited zircons, monazite and apatite, which are enclosed in biotite, would be considered as restite. Geochemical criteria emphasise the petrographic evidences. Accordingly, the anatexis of upper crust is likely to have been mainly controlled by biotite breakdown.

Keywords: restite, anatexis, S-type granite, geochemistry, Shir-Kuh.