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Petrogenesis of microgranular enclaves in Aligoudarz granodiorite

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Abstract: The Aligoudarz granitoid occurs in the central part of the Sanandaj-Sirjan Zone, western Iran. It comprises three distinct facies mainly of tonalite, granodiorite and granite composition. Magmatic microgranular enclaves (ME) extensively occur in granodiorite. Field, textural, whole rock and mineral chemistry data of the ME and the host rocks does not support magma mixing as the ME-forming mechanism. Major and trace elements variation diagrams, similarities in spider diagrams and geochemical modeling indicate the cogenetic relation of the ME and host rock. Fractional crystallization is the main process in the geneses of ME. Rapidly-cooled borders of the magma chamber can best explain formation of the ME. ME are the result of later fragmentation and dispersal of the rapidly-cooled borders in the host magma. These enclaves recorded the least degree of chemical exchange with the host. Biotite and amphibole crystallize with more rapid nucleation rates in rapid cooling zones. This process can explain different chemical behavior of the ME and the host rock.

Key words: *Aligoudarz; chilled margin; enclave; geochemistry; magma mixing; Sanandaj-Sirjan.*

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