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A new approach in the interpretation of nature of Migmatitization and their Sources: Western Anatolia Turkey

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Most of migmatite of western Anatolia are exposed parallel to or at the contact of granitic intrusion of western Anatolia. They have a gentle topography and mostly intruded by granite intrusions ranging in size from hundred meters up to hundred kilometers in dimensions. The nature of all these units are examined through geology, petrography, geochemistry and confocal Raman spectroscopy methods. Degree of partial melting and nature of psammitic migmatites from the metamorphic belt, Western Anatolia is determined utilizing whole-rock trace element compositions and behavior of Raman shift spectra of feldspar of migmatite and granite intrusive rocks. The key minerals used in this study were taken from the migmatite and granite intrusions as feldspar, biotite and amphibole minerals. The thin section textural features are used to estimate of the melting degree by a simple mass-balance calculation, giving the result of 10–15 wt % of partial melting of the psammitic rocks. Similar calculations applied to the migmatite samples, which assume average migmatite compositions to be the residue solid fraction give degree of melt extraction of 15–20 wt % from the migmatite zone. Development of migmatite formations were controlled by granite magmas temperatures and their chemical compositions. The Raman shift spectra of feldspar and biotite reveal a genetically relation with the psammitic rocks due to high temperature of granitic intrusions.
ORG normalized elemental pattern of most of the granitic intrusive of the Western Anatolian migmatite is enriched with the LIL elements with respect to HFS elements. Whole rock, trace and rare earth element results reveal that most of these intrusive were intruded to Menderes Massif as a result of volcanic arc nature magma in the form of H type granitoid which derived from the partial melting of upper continental crust and contaminated with the lower crust.