

## 5.5.55

## Amphiboles as a petrogenetic indicator of granitoid enclaves: Oymaagac, Turkey

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In the Ankara region, the Oymaagac granitoids (alkali feldspar granite, biotite amphibole granite and amphibole granodiorite) belong to the Bey pazari granitoid of Sakarya continent. Amphibole granodiorite is the main lithologic unit of the region and is divided into three subgroups according to the proportion of amphibole. The Oymaagac granitoids have oval, elliptical and angular mafic enclaves that range in size from 1 mm to 20 cm. On the basis of texture and mineral composition, three types of enclaves are distinguished. The first has a magmatic (subophitic) texture with plagioclase, pyroxene, and amphibole as well as rare amounts of K-feldspar, biotite, titanite and opaque minerals. These enclaves range in composition from diorite at the rim of the intrusion through quartz diorite to monzodiorite-quartz monzodiorite at the core of the intrusive body and probably represent blobs of mafic magma forming mafic microgranular enclaves (MME). The second type has metamorphic textures (hornfels at the rim, amphibole core) with amphibole, plagioclase, epidote, titanite and opaque minerals, and these are interpreted as xenoliths. The composition of amphibole in the first type of enclaves and their host rocks ranges from magnesio-hornblende to ferro-hornblende. The second type of enclaves show amphiboles rich in Si and Mg/(Mg + Fe<sup>2+</sup>) and range from tremolitic hornblende to actinolitic hornblende (Fig. 1).

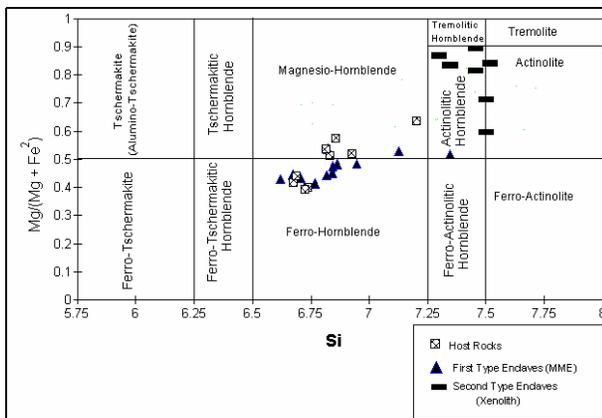


Fig. 1 Classification diagram for the amphiboles of the Oymaagac granitoids and their enclaves.

## 5.5.61

## Oxidized rapakivi-type granites of Carajás, Brazil: A-type or I-type?

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Three Paleoproterozoic, A-type rapakivi granite suites were emplaced in the Archean terranes of the Carajás Province, eastern Amazonian craton: Jamon, Serra dos Carajás, and Velho Guilherme. All suites have similar ages and are composed essentially of (hornblende)-biotite monzogranites and syenogranites. Oxidizing conditions (NNO +0.5) characterized the crystallization of the Jamon magmas. The Velho Guilherme and the Serra dos Carajás magmas were reducing. The three granite suites have Archean  $T_{DM}$  model ages and strongly negative epsilon Nd values (~ -12 to -8 at 1880 Ma) and they were derived from Archean crust. The contrasts between these suites are related to the nature of their magma sources. The oxidized Jamon suite granites are similar to the Mesoproterozoic, A-type magnetite-series granites of Laurentia. The Serra dos Carajás and Velho Guilherme granites approach the classic reduced rapakivi series of Fennoscandia and Laurentia. The Serra dos Carajás and Velho Guilherme granites display the general characteristics of A-type granites, and are similar to the more evolved Finnish rapakivi granites. Their classification as A-type granites is not controversial. The same is not true for the Jamon suite granites. Adopting a strict definition for A-type granites, these oxidized granites can be seen as representative of I-type, not of A-type granites. Moreover, oxidized granites are generally correlated with calc-alkaline granites. However, the Jamon granites show a very restrict petrographic and compositional range and differ in this respect from the expanded series of I-type and calc-alkaline granites. Trace elements in the Jamon granites also indicate affinities with within-plate and A-type granites, not with I-type or calc-alkaline granites. The low Al<sub>2</sub>O<sub>3</sub> content of the Jamon granites is another evidence against its possible calc-alkaline character.

We conclude that the Jamon granites and similar oxidized granites are not calc-alkaline granites and should not be classified as I-type. They can be seen as a subtype of A-type granites if an enlarged definition is adopted for this type. Alternatively, they can be simply associated to the rapakivi granite series, admitting that these series would include crustal granites related to the underplating of mafic magmas, irrespective of the nature of their sources (S-type granites excluded). This possibly implies to dissociate the definition of rapakivi granite from that of A-type granite. The central point in this discussion is the ambiguous character and the need for a more clear definition of A-type granite.