



Petro-geochemical constraints for origin of pyroxenites xenoliths associated with mantle peridotites from Adrar N'ajjer caenozoic volcanics (NE Ahaggar, Algerian Sahara)

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The caenozoic alkali basaltic rocks from Adrar N'ajjer volcanic massif (NE Ahaggar) contain numerous xenoliths. Most of them correspond to mantle peridotite xenoliths, dominantly lherzolite with minor harzburgite characterized by the typical mineral assemblage Ol-Cpx-Opx-spinel. Moreover the xenolith suite also includes a wide variety of plutonic rocks, mostly cumulates, some of them displaying hydrous-mineral phases such as amphibole and phlogopite. Five types of pyroxenites have been recognized in the present study in this magmatic suite.

(1) Garnet-Sapphirine-Spinel-Plagioclase bearing pyroxenite with reactive mineral association, (2) olivine + amphibole + phlogopite bearing clinopyroxenite with two magmatic glass- and amphibole-bearing veins, (3) amphibole-bearing websterite (with volcanic glass), (4) plagioclase-bearing websterite and (5) layered metagabbro.

The available geochemical data (major and trace element) of minerals particularly for clinopyroxene (trace-element patterns) suggest different mantle sources and complex petrogenetic processes. The investigated xenoliths point out both tholeiitic-transitional and alkaline parental magmas emplaced at different depths ranging from infra-crustal to upper-mantle.

The metagabbroic xenolith is a witness of a cumulative stratified magmatic intrusions occurring at the crust-mantle boundary beneath the Adrar N'ajjer volcanic region as previously suggested by study of similar xenoliths from Edgereg (Kornprobst et al., 1987).

Finally, the Adrar N'ajjer pyroxenite samples highlight a complex upper mantle history implying two main mantle sources characterized by different compositions. Such evidences indicate the occurrences of mantle heterogeneities beneath the Adrar N'ajjer. The occurrence of magmatic veining and hydrous mineral phases records several magmatic and metasomatic processes affecting this region of the upper mantle.