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MANTLE XENOLITH-BEARING VOLCANICS FROM THE CAINOZOIC ADRAR N'AJJER MASSIF (North Central-oriental Hoggar, South Algeria) : PETROLOGICAL EVIDENCES

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Mantle peridotite xenoliths enclosed in the Plio-Quaternary alkaline basalts from the Adrar N'ajjer massif (North Central-Oriental Hoggar shield) consist dominantly of protogranular to porphyroclastique lherzolites with minor harzburgites and dunite. They are characterized by a typical four-phase mineral assemblage of Ol-Opx-Cpx-Spin. A preliminary investigation of the major- and trace-element compositions of mineral assemblages, concentrated on the Cpx of the spinel lherzolite and harzburgite xenoliths, shows a range of composition and REE variations consistent with depletion by melt extraction, followed by varying degrees of metasomatic enrichment.
The peridotite suite also contains many composite xenoliths that illustrate the development of intrusive cumulate rocks (websterites, clinopyroxenites, metagabbros etc.) and contain evidence of modal metasomatism (amphibole and phlogopite–bearing assemblages, Mg–Ilm megacrysts). This wide variety of petrographic features, and the chemical heterogeneity within single samples, suggests complex processes of magmatic and metasomatism infiltration. Some xenoliths are lherzolite and harzburgite percolated by migrating melts to produce porphyroclastic amphibole-rich ultramafic rocks with strong LILE enrichment and highly variable HFSE abundances. We assume that these melts may be alkaline melts rising from the asthenosphere.