

EVIDENCE FOR THE PRESENCE OF A CARBONATED MANTLE AND CARBONATITE COMPLEX BENEATH SAGHRO (ANTI-ATLAS, MOROCCO)

A. Ibhi, H. Nachit, E.H. Abia and N. Icame

Geology Department, Ibn Zohr University, Faculty of Sciences. B.P. 28/S Agadir, Morocco.

ABSTRACT

The Plio-quaternary Fom El Kouss volcano (Anti-Atlas, Morocco) is composed by pyroclastic rocks and two volcanic phases of Pleistocene to Recent age: massive lava flows of olivine nephelinites first, and pyroxene-nephelinites towards the top.

Carbonatite inclusions have been found in the pyroxene nephelinites. Major mineral phases are SrO-rich (6 wt%) calcite, SrO-rich (1.8 wt%) fluorapatite, ZrO-rich (24.1 wt%) pyrochlore (19.4 wt% Nb₂O₅), barian titanian biotite (21 wt% BaO and 14 wt% TiO₂), magnetite (with ilmenite exsolution) and salite. Reaction rims around these enclaves, made of fluorine rich glass, confirm their xenolithic origin.

Spinel lherzolitic xenoliths are also found in these nephelinites and display mineralogical evidence of interaction between the lithospheric mantle and the carbonated fluids. The destabilization of these spinel peridotites can be summarized by the reaction: orthopyroxene₁ + spinel₁ + diopside₁ + olivine₁ + "carbonated" fluid \Rightarrow diopside₂ + olivine₂ + chromite + apatite + K-feldspar.

Such an association of carbonatite inclusion and spinel lherzolite with Fom El Kouss nephelinites suggests the presence of an underlying carbonatite complex and carbonated mantle in the Anti-Atlas region.

