adjacent continental crust of the Arabian-Nubian shield differentiated during Pan African times or a new crust constituted by Miocene clastic sediments crosscut by basic bodies and then metamorphozed and deformed by the diapir. Sm-Nd and Rb-Sr well defined internal isochrons respectively yield ages of 655±8 Ma and 669±34 Ma for a felsic granulite. Thus the HP-HT metamorphic event (850°C, 10kbar) recorded in the mineral paragenesis of this granulite is Panafrican. In addition to the initial Nd ratio of the felsic granulite, Nd and Sr model ages and Pb isotope systematics of Zabargad gneisses suggest a crustal development during the period 1200-850 Ma, in good agreement with previous models of crustal formation proposed for the Arabian shield. Comparison of Pb isotope composition of basic gneisses, peridotites and diabases from Zabargad, clearly show that at least, one part of the basic gneisses cannot be considered to have been recently added to the lower continental crust exposed in the island by underplatting processes.

XVII/5 DATING, GEOCHEMISTRY AND GEODYNAMIC SIGNIFICANCE OF THE MESOZOIC MAGMATISM OF THE BENUE TROUGH, NIGERIA

P. BAUDIN, C. COULON, H. MALUSKI, M. POPOFF and P. VIDAL
(Laboratoire de Pétrologie Magmatique, URA 1277, Faculté des Sciences de St Jerôme, Université d'Aix-Marseille III, France)

The Benue Trough is a 1000 km long NE-SW intraplate structure. Its genesis which is closely related to the opening of the South Atlantic Equatorial domain, was initiated in early Cretaceous times. A mesozoic magmatism, volumetrically restricted, is scattered throughout this trough ; it is represented by a great variety of rocks (basalts, gabbros, syenites, trachytes, phonolites, rhyolites). Petrological, mineralogical, geochemical and radiometric ($^{39}Ar/^{40}Ar$ method) studies have been performed on these rocks. According to our data, the Benue magmatism ranges in age from 140 to 50 Ma. Thus, it appears to be a link in the migration of the magmatism which occurred in the Western part of the African Plate from Ordovician until Present, within the following provinces (from North to South) : Air (480 to 400 Ma), Damagaram (320 to 290 Ma), Jos Plateau (215 to 140 Ma), BenueTrough (140 to 50 Ma), Cameroon Line (65 to Present).

The Benue Trough magmatism display alkaline or tholeiitic affinities. Sr and Nd isotopic data lead to distinguish two mantle sources : (1) a first one which generated the alkaline magmas [$0.7028 < (^{87}Sr/^{86}Sr)_i < 0.7037$ - $0.5126 < (^{143}Nd/^{144}Nd)_i < 0.5129$], (2) a second one, more radiogenic, which originated the tholeiites [$0.7042 < (^{87}Sr/^{86}Sr)_i < 0.7065$ - $0.5125 < (^{143}Nd/^{144}Nd)_i < 0.5127$]. According to the present isotopic and geochemical data, the thinned continental crust seems to have no significant role in the genesis of this magmatism.

B 34842
INDEX 1= 2
23.10.91

XVII/6 COMPARISON OF K-Ar AND ^{39}Ar-^{40}Ar ON GRANITES AND ON EMERALD-BEARING METASOMATITES FROM CAMPO FORMOSO AND CARNAIBA, BAHIA, BRAZIL

G. GIULIANI, J. L. ZIMMERMANN, A. CHEILLETZ and R. MONTIGNY
(Centre de Recherches Pétrographiques et Géochimiques, BP 20, 54501 Vandoeuvre les Nancy Cedex, France)

The Campo Formoso and Carnaïba granitoid suites belong to a major series of Middle Proterozoic magmatic rocks intruding the Archean basement and the Lower Proterozoic Serra da Jacobina volcanosedimentary series. Emerald-bearing K-metasomatites developed in serpentinites at or near the contact with the granites. The granitic suites have a perialuminous leucogranitic major elements geochemistry with obvious S-type characteristics but with an unusual magmatite-allanite association.

K-Ar and ^{39}Ar-^{40}Ar dating of the different granites show that their emplacement took place between 1950 and 2000 Ma. These are characterized by an isochron at 1980 ± 30 Ma for the muscovites and a plateau age at 1970 for the biotites. The deuteric-hydrothermal alteration with an important chloritization of their biotites leads to a loss of radiogenic argon and younger K-Ar ages (1890 Ma).

The K-metasomatites give isochron ages at 1954 Ma for Socoto and 1958 Ma for Carnaïba. These ages are near or a little younger than those of the granites.

Enrichment in radiogenic argon found in emeralds and in some granitic muscovites leads to question the real age of their crystallization and the origin of metasomatic fluids.

XVII/7 ^{39}Ar-^{40}Ar DATING ON IGNEOUS ROCKS FROM THE BODRUM VOLCANIC COMPLEX, SW TURKEY

R. MONTIGNY and U. ROBERT
(EOPGS, 5 rue Descartes, 67084 Strasbourg, France)

We report new 39Ar-40Ar data on the Bodrum Volcanic Complex, a moderately dissected stratovolcano with mainly thick units of fragmentary rocks and several small subvolcanic intrusive bodies which represents the most important Upper Miocene volcanic structure of the south-eastern Aegean region.

The 39Ar-40Ar ages range from 9 to 9.8 Ma and are interpreted as time of emplacement in accordance with geological observations and similar ages found for biotite and amphibole. These data confirm the short time span of ≈ 1 Ma previously established for the building up of the major part of this volcano where emission of under- and over-saturated, high-K and shoshonitic varieties seem to have occured contemporaneously, and was followed by an episode of monzonitic or monzogabbroic intrusions. The 39Ar-40Ar ages are slightly younger than previous K-Ar data by Montigny and Robert (1989) and show some of the latter to be due to excess argon, particularly in samples from pyroclastic units.

The Bodrum Volcanic Complex is considered to be part of a belt of Middle to Upper Miocene igneous activity extending from the greek mainland to the turkish coast. In its Western part, igneous rocks are mainly represented by intrusive bodies of granitoids, whereas in the East, several composite volcanoes have erupted a variety of extrusive and intrusive rocks of weakly alkaline potassic affinities. This reflects differences in post- and probably also synmagmatic tectonic setting. Strong similarities in petrological and geochemical characteristics suggest that scattered volcanic outcrops and a large quartz-monzonite massif in the island of Kos may have formed a unity with the Bodrum Volcanic Complex and represent a lower level having undergone relative uplift and erosion.

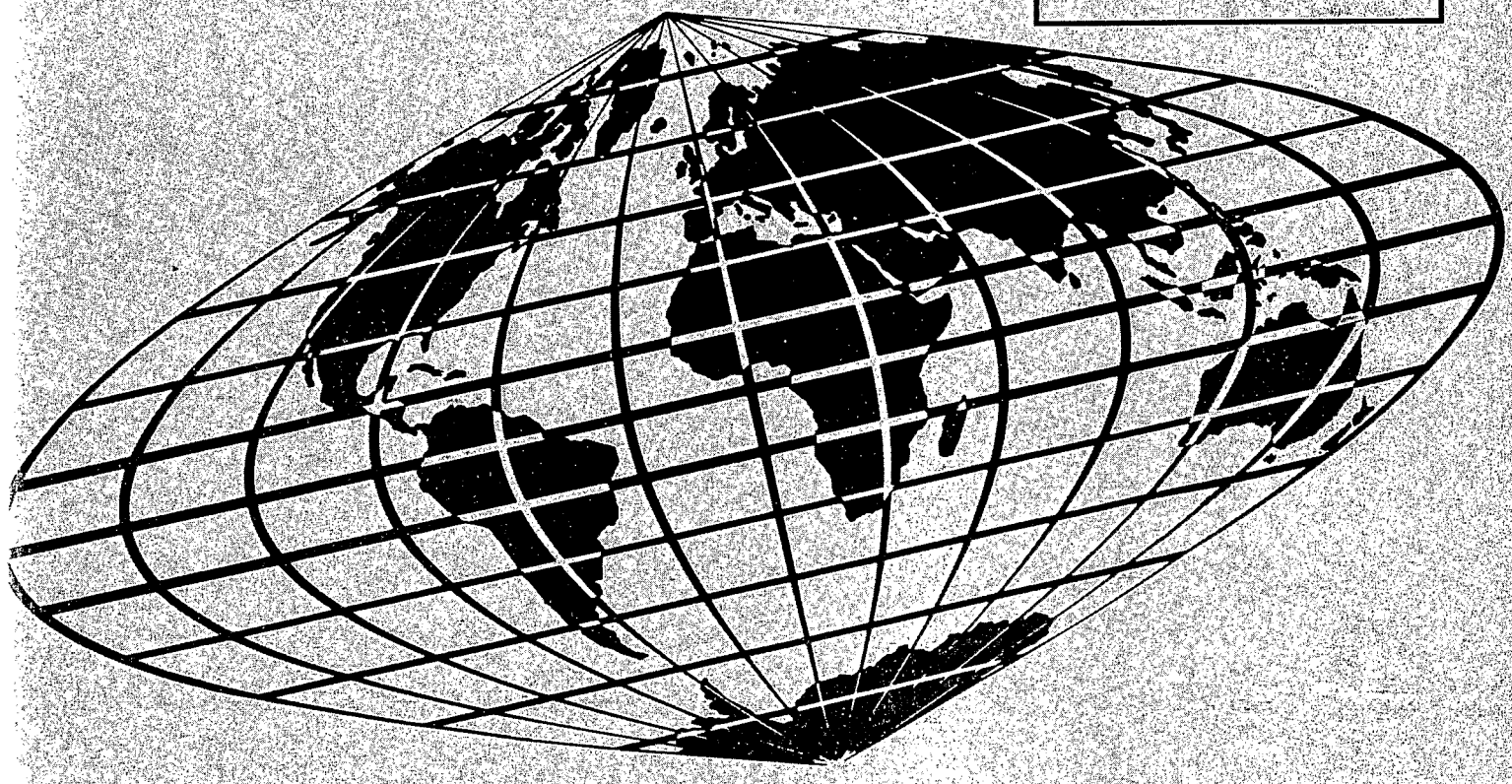
O.R.S.T.O.M. Fonds Documentaire
N° : 34.842 ex 1
Cote : B
23 OCT. 1991

ISSN 0954 4887

TERRA abstracts

Volume 3, Number 1, March 1991

EUG VI
Strasbourg
24–28 March 1991



FDO
34.842 ex 1
B
P65

An Official Journal of the European Union of Geosciences