

a Ti-rich (-3%) group dominant in the northern, and a Ti-poor (-2%) group dominant in the southern portion of the Paraná Basin. In the central portion there is a transitional zone where these two units intercalate. A third unit has been observed to the NW of this area, with 2 to 3% Ti content (Bellieni et al., 1984; Mantovani et al., 1985).

Sr isotope analyses show that this last group has $87\text{Sr}/86\text{Sr}$ ratios of .7056 to .7065, slightly higher than those of the more Ti-rich series (.7051 to .7058), whereas the range is wider in the Ti-poor group (.707 to .725). The radiogenic isotopes of Pb and Nd have been determined in the same rocks. In the Pb diagrams all points lie above the northern hemisphere reference line (NHRL) defined by Hart (1984) that crosses the MORB field. The points representing samples with low Ti contents occur along the more radiogenic portion of the trend; the other two groups are essentially superposed on each other, except that the $208\text{Pb}/204\text{Pb}$ ratios are somewhat lower for the intermediate rocks. Considering the observed trend as an isochron, the resulting date of 1.7 Ga indicates the mean age of the source of these flows. This value is in agreement with those corresponding to the date model (DM) of the Nd, calculated for more primitive samples (Mantovani, 1986).

The samples of the series poorer in Ti, modeled by AFC processes, favor assimilation of rocks whose composition is consistent with partial melting of the upper crust. This process is not marked for the other two series, indicating that the processes of partial fusion and fractionated crystallization of the source are the principal factors responsible for the compositions observed in the central and the northern portions of the Serra Geral Fm.

ALKALINE INTRUSION OF PARIQUERA-AÇU: IMPLICATIONS FOR SOUTH-ATLANTIC EVOLUTION

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The tectonic-magmatic phenomena that took place during the Wealdenian Reactivation or South-Atlantic Event are intimately related to the evolution of the rift that separated South America from Africa and gave rise to the South Atlantic Ocean. There is general agreement that the timing of the magmatism of SE Brazil, represented by the flood basalts of the Serra Geral Fm., by mafic dykes (150-120 Ma) and by mafic alkaline rocks (130-120 Ma), was related to the rifting of the southern portion of the South Atlantic.

The aeromagnetic and geologic identification of major crustal discontinuities along the Ponta Grossa Arch, transversal to the main rift trend, has been followed with great interest by those studying the origin of the South Atlantic.

Recently, alkaline rocks (malignites, nepheline syenites) were identified by aeromagnetic anomalies near the town of Pariquera-Açu in São Paulo State. We consider this manifestation to be controlled tectonically by the Guapiara Alignment, since it lies between the similar already known occurrences of Jacupiranga and Juquiá and within the dense swarm of mafic dykes that characterizes this discontinuity. A K-Ar dating of

K-feldspar at the geochronologic Research Center of São Paulo University (USP) gave 200 ± 3 Ma, interpreted as close to the age of rock formation. Although more detailed geophysical, geologic, petrologic and geochronologic studies are still in progress, the unusual age permits to date the first phase of South Atlantic rifting, in agreement with the model proposed by the PETROBRÁS work group for the Paraná Basin, as having occurred at the Triassic/Jurassic boundary.

Basic rocks of similar ages occur on both continents. In Namibia an age of 183 ± 4 Ma was obtained from almost 200 analytic data. In Angola an age of $222 \pm$ was found for the Nova Redonda basalt. In South America, apart from those datings in the plate interior which are probably related to the opening of the North Atlantic, similar ages have been obtained in Uruguay (211 Ma) and in Brazil (Florianópolis 190 Ma; Jaguariaíva 161 Ma; Ubatuba 206 Ma).

In agreement with the PETROBRÁS model mentioned above, it is suggested that crustal discontinuities related to the Ponta Grossa Arch acted as obstacles to rift propagation. At least 60 Ma of stress rise was necessary before oceanic opening was allowed to continue, giving rise to the basaltic and alkaline igneous activity at the times described above. It is important to note that, during Triassic time, the uplift of the region now occupied by the Ponta Grossa Arch divided two sub-basins in which the Pirambóia and Rosário do Sul Formations were deposited, and that the tectono-thermal event of about 200 Ma ago would be responsible, in its area of influence, for the isotopic rehomogenization of strontium in some formations of the Paraná Basin, already mentioned by others authors.

VOLCANO-SEDIMENTARY SEQUENCE OF NEOCOMIAN AGE IN CAMPOS BASIN (BRAZIL)

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Igneous basic rocks with thin intercalations of volcaniclastic and sedimentary rocks constitute the economic basement of Campos Basin in Brazilian continental margin.

This volcano-sedimentary sequence has been a producer of hydrocarbons in three oil fields (Badejo, Linguaço and Pampo).

Core analysis of sixteen wells in which the volcanic section was sampled give the characterization of igneous basic rocks, volcaniclastic and sedimentary rocks.

A classification for volcaniclastic rocks is here proposed based on the occurrence of these rocks in Campos Basin and on the nomenclature published in specialized literature. Autoclastic, pyroclastic and epiclastic rocks were recognized as a function of the fragmentation process.

The study of these rocks and their association made possible the recognition of the volcano-sedimentary model for the study area. In Campos Basin, one can recognize areas with subaqueous volcanism and areas with subaerial volcanism. Subaerial volcanism was marked by explosive episodes and it is represented by red volcanic tuffs. Subaqueous volcanism marked by the mixture of basic lavas and sediments. These sediments were interpreted to be deposited in a lacustrine environment.