

2350 Ma at 1370°C to reach a plateau equivalent to ca. 3000 Ma from 1420°C. This in accord with an event at ca. 2200 Ma seen in the SHRIMP data, where there would have been not only development of partial overgrowths but also variable loss of some radiogenic Pb from "damaged" ca. 3000 Ma zircon as well.

The IDTIMS study involved analysis of multigrain unabraded aliquots and also leached grains, now known from CL images to be structural complex. The upper concordia intercept (3055 Ma) can only be considered as an "average", indicating an important component of Mesoarchean zircons. Two leaching phases yielded close to concordant dates at ca. 2390 Ma – in agreement with the more interpretable SHRIMP indications of ca. 2200 Ma zircon growth/thermal disturbance.

It is considered that in this complex rock it is fortuitous that IDTIMS, EVTIMS and SHRIMP results give essentially the same protholith ages. In the other cases in the literature where there have been comparative EVTIMS/IDTIMS – SHRIMP studies of geologically complex samples with structurally complex zircons, dates by the methods do not always agree. However, when geologically simple samples are dated by the different methods the results are generally in good agreement. — (*May 24, 2002*) .

* E-mail: keisato@usp.br

C-ISOTOPE COMPOSITION OF EARLY PALEOPROTEROZOIC CARBONATES FROM THE MINAS SUPERGROUP AND THE RECORD OF THE LOMAGUNDI PHENOMENON IN BRAZIL

ALCIDES N. SIAL¹, VALDEREZ P. FERREIRA¹ AND ANTONIO W. ROMANO²

¹NEG-LABISE, Department of Geology, UFPE, Cx. Postal 7852, 59732-970 Recife, PE, Brazil.

²Institute of Geosciences, UFMG, 30430-120 Belo Horizonte, MG, Brazil.

The Paleoproterozoic $\delta^{13}\text{C}_{\text{carb}}$ positive excursion (2.25-2.05 Ga; Lomagundi phenomenon) has a global character, but no occurrence in South America has been registered. This study reports, by the first time, this C isotope anomaly in Brazil, in the early Paleoproterozoic, marine carbonates of the Fecho do Funil Fm., Minas Supergroup.

The 2.42 Ga-old Gandarela Fm. consists of red carbonate BIF at the base of the sequence (Minas Super-

group), gradually replaced upwards by buff dolomites, and limestones, locally stromatolitic, in light and dark-gray alternating bands. Carbonates display $\delta^{13}\text{C}_{\text{carb}}$ from -1.6 to $+0.4\text{‰PDB}$ (n=58), the most negative values found in red dolomites in contact with the underlying, finely laminated, Cauê banded iron formations. Gandarela carbonates from the Heargraves quarry yielded $\delta^{13}\text{C}_{\text{carb}}$ from -1.4 to -0.6‰PDB (n=28). In the Cercadinho Fm., at the base of the Piracicaba Group, $\delta^{13}\text{C}_{\text{carb}}$ varies from $+3.3$ to $+4.2\text{‰PDB}$ (n=10), values decreasing erratically with depth.

The Fecho do Funil dolomites (2.11 ± 0.11 Ga, deformation/metamorphic age) were probably deposited within the time span for the Lomagundi positive excursion age of the Kaapval craton, Africa. The sampled section of this Formation consists, at the base, by fine-grained, stromatolite-rich white and pink dolostones, and then by fine-grained white marble. Stratigraphically collected samples show $\delta^{13}\text{C}_{\text{carb}}$ remarkably homogeneous ($+6.0$ to $+6.5\text{‰PDB}$, n=47). The oxygen isotopes are also fairly constant (-9.7 to -10.8‰PDB) and show a trend which is rather antipathetic to the variation in C isotopes. These high $\delta^{13}\text{C}_{\text{carb}}$ carbonates show little scatter, relatively shallow trend on $\delta^{13}\text{C}$ vs $\delta^{18}\text{O}$ diagram and are consistent with low-grade metamorphic decarbonation. The elevated C-isotope values were least reset and probably reflect their protolith composition, rather than subsequent diagenetic or metamorphic processes. This Formation is a proxy, in South America, for the global Lomagundi phenomenon.

There is no evidence for the triad early Paleoproterozoic glacial events of the (2.45 – 2.25 Ga interval) recognized in North America. C isotope patterns for carbonates of the Minas Supergroup suggest that the Gandarela Fm. was deposited around 2.4 Ga; the moderate C positive anomaly of the Cercadinho carbonates suggests deposition around 2.35 and the Fecho do Funil carbonates were deposited probably around 2.2 Ga. — (*May 24, 2002*) .

A NEW INTERPRETATION ON THE SERGIPANO BELT DOMAIN

MARINHO A. SILVA-FILHO AND HELTON H. F. TORRES
Companhia de Pesquisa de Recursos Minerais (CPRM), Recife, PE, Brazil.

Presented by ALCIDES N. SIAL

This study deals with newly identified tectonic-

stratigraphic domains in the Sergipano and Sul-Alagoano belts of the Borborema Province, northeastern Brazil. In the first belt, besides the well-known domains of Macururé, Vaza Barris and Estância, two others are recognized: Rio Coruripe and Viçosa. The Rio Coruripe domain contains rift-related volcano-sedimentary sequence, metabasalts and iron-formation bearing, intruded by mafic-ultramafic layered complex. The Viçosa domain consists of a metamorphosed volcano-sedimentary sequence; Mesoproterozoic plutonic rocks with 1.57 Ga (U-Pb) and 1.0 Ga (Rb-Sr) and Neoproterozoic peraluminous granitoids with 0.75 Ga (Rb-Sr) and calc-alkaline granites with 0.59 Ga (U-Pb). Carbonates from the Olhos d'Água Fm. of the Vaza Barris domain have an isotopic signature similar to that of the Bambuí group, distinct of the Jacoca carbonates (Miaba group). The Palestina Fm., at the base of the Olhos d'Água Fm., encloses Miaba group deformed pebbles. The last one, chronocorrelated to the Macururé group, is Mesoproterozoic in age. The Sul-Alagoano belt has two domains. The Canindé-Marancó domain hosts flysch-type volcanoclastic sedimentation; calc-alkaline volcanic rocks with 1.04 Ga (U-Pb; TDM=1.2 Ga); tonalitic (TDM=1.75 Ga) and peraluminous (TDM=1.66 Ga) Mesoproterozoic plutonic rocks; early peraluminous Neoproterozoic plutonic rocks (U-Pb; 0,715 Ga); podiform chromite-bearing ultrabasic rocks that could be mantle-derived ophiolitic slices. The Pernambuco-Alagoas domain shows a characteristic tonalitic-dominant Mesoproterozoic plutonism (TDM=1.3 Ga); fracture-bound late shoshonitic/peralkaline and peraluminous magmatism (0.58 Ga, Rb-Sr and TDM=1.0 Ga).

The Sergipano belt has rift-related and Atlantic margin Meso/Neoproterozoic platform sedimentation. Basement nucleus (TDM=3.0 Ga), granitoids from the Macururé domain with model ages between 1.71 and 1.3 Ga and from Viçosa domain between 0.9 and 2.5 Ga, suggest a sialic basement. The Marancó/Canindé calc-alkaline volcanics and ophiolites (?) point to the presence of oceanic crust in the Sul-Alagoano belt. Abundant Mesoproterozoic tonalites resemble a thickened Andean-type arc in the Pernambuco/Alagoas domain, with extensional shoshonitic/peralkaline magmatism (0.58 Ga, Rb-Sr). There were two stages of amalgamation in the Sergipano and Sul-Alagoano belts: at 1.0 and at 0.75 Ga, characterized, respectively, by Caririano- and Brasileiro age peraluminous granitoids. The sutures between belts and their domains are bounded, respectively, by the Belo

Monte/Jeremoabo shear zone and granites, both showing remarkable magnetic anomalies. — (*May 24, 2002*) .

HYDRODYNAMICS OF THE AMAZON BASIN

PIERRE SABATÉ

Institut de Recherche et Développement (IRD), Brasília, DF.

Registered under the CNPq/IRD convention, the HYBAM project is a model of multi-institutional and international cooperation. It involves the ANA, ANEEL and UnB, as well as researchers from other Brazilian (USP-CENA, UFRJ, IBGE, IEPA) Institutions and some neighboring countries (Bolivia, Peru and Equator).

We show here the wide spectrum of collected data on the Amazon River and its affluents, from Tabatinga to the Atlantic Ocean and an extensive view on modelling and applied domains. Complementary approaches are developed to understand hydrologic dynamics related to climatic forcing, sedimentary and geochemical dynamics.

The methodology implements a hydrologic permanent station net. The studies cover an altimetric calibration of the whole hydrologic network, rivers discharge gorges and several parameters to quantify dynamic processes. They encompass the wave tide influence on liquid and sedimentary discharge of the Amazon River and the influence of climatic index on its respective variability. The role played by flood plains on hydrodynamics is studied and inundation dynamics is followed by satellite imagery. Balance between erosion, transfer and depositional processes, from Andean sources to flood plains, is estimated by flux method and the present sedimentation, by geochemical tracers and geochronologic models. Space and time variability of trace element signatures of surface waters is studied to evidence trap areas and speciation risks of some heavy metals related to a historic study of mercury contamination.

One of the scopes is the Amazon river hydrology modeling (climate versus river discharge relation), its hydrodynamics applied to the prediction of water levels, flow velocities and flood plain dynamics, and of its sedimentology (transport capacities and sediment trapping quantification). Modeling will be useful to investigate the impact of anthropic activities (dams, mining, and so on) improve management of water resources, predict floods (cities of Manaus or Santarém) as well as navigability conditions (Madeira River). The research teams are preparing the corresponding GIS-Amazônia for these studies. — (*May 24, 2002*) .