

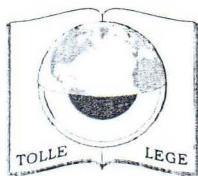
Journal of Conference Abstracts

*Volume 4
Number 1
March 1999*

EUG 10



ABSTRACT VOLUME



ISSN 1362-0886
Cambridge Publications
1999

European Union of Geosciences
March 28th - April 1st, 1999
Strasbourg, France



EUG 10

Babinski, M.



28th March - 1st April 1999
Strasbourg (France)

ABSTRACTS

EUROPEAN UNION OF GEOSCIENCES

5, rue René Descartes
67084 Strasbourg Cedex - France

Tel: 33 (0)3 88 450191 or 33 (0)3 88 416393
Fax: 33 (0)3 88 603887

E-mail: eug@eost.u-strasbg.fr
Website: <http://eost.u-strasbg.fr/EUG>

O09 : 4P/20 : PO

SIMULTANEOUS U-Pb ISOTOPE RESETTING AND REMAGNETIZATION IN NEOPROTEROZOIC CARBONATES OF THE SAO FRANCISCO BASIN, BRAZIL

Marly Babinski (babinski@usp.br)¹,
Randy Van Schmus (rvschmus@kuhub.cc.ukans.edu)²,
Manoel D'Agrella (dagrella@iag.usp.br)³ &
Ricardo Trindade (rtrindad@iag.usp.br)⁴

¹ Instituto de Geociências, Universidade de São Paulo, Caixa Postal 11348, São Paulo, SP, Brazil

² Department of Geology, University of Kansas, Lawrence, KS, USA

³ Instituto Astronômico e Geofísico, Universidade de São Paulo, São Paulo, SP, Brazil

⁴ Instituto Astronômico, Universidade de São Paulo, São Paulo, SP, Brazil

The southern part of the Neoproterozoic São Francisco basin, in Minas Gerais State, Brazil, can be divided into three domains: (a) the central part of the basin where rocks are undeformed; (b) the western domain where rocks have been deformed by the 600-550 Ma Brasília fold belt, and (c) the eastern domain where rocks have been affected by the 600-550 Ma Aracuaí fold belt. U-Pb and Pb isotopic data, rock magnetism data, and paleomagnetism data from the carbonates collected from different domains support a close connection between a pervasive remagnetization and a large scale fluid percolation event that strongly affected the isotopic system of these rocks at 530-500 Ma, during the final stages of the Brasiliano/Pan-African orogeny. A Pb-Pb isochron age of 686 ± 69 Ma has been determined from undeformed carbonates in the center of the basin, and it is interpreted as the minimum depositional age. However, most of the Pb-Pb and the U-Pb ages obtained from deformed as well as other undeformed carbonates fall in an interval of 550-500 Ma. Carbonates containing radiogenic crustal Pb with an isotopic signature of the Archean/Paleoproterozoic basement were found in the central portion of the basin, which was not affected by deformation, suggesting that this Pb was incorporated into the carbonates through fluids which promoted the resetting of the isotope system and severe remagnetization in the carbonates. A post-depositional origin of the magnetization directions is strengthened by the following: (a) the rock magnetic properties, such as wasp-waisted hysteresis loops, anomalously high hysteresis ratios and contradictory Lowrie-Fuller and Cisowski tests, are typical of remagnetized carbonates; (b) thermomagnetic analysis and scanning electron microscopy suggest authigenic magnetite as the main magnetic carrier, and (c) paleomagnetic poles from carbonate sequences and adjacent Brasiliano metamorphic rocks are similar and coincide with high quality Gondwanan paleomagnetic poles for the 530-500 Ma interval. The similarity between paleomagnetic and isotopic results from the Bambuí and the ca. 1000 km far north Una carbonates from the São Francisco basin implies a large scale fluid percolation event that simultaneously affected the whole basin.

O09 : 4P/21 : PO

EARLY PROTEROZOIC ISOCHRON AGE OF GALENAS FROM NEOPROTEROZOIC SULFIDES, IRECE BASIN, BAHIA, BRAZIL

Theofilos Toulkeridis (theo@illite.u-strasbg.fr)¹,
Aroldo Misi (misi@ufba.br)²,
Wolfgang Todt (todt@mpch-mainz.mpg.de)³,
Adriana, S. R. Gomes⁴,
Marly Babinski (babinski@usp.br)⁴ &
Robert Buchwaldt (buchwaldt@mpch-mainz.mpg.de)³

¹ Centre de Géochimie de la surface (CNRS), 67084 Strasbourg, France

² Centro de Pesquisa em Geofísica e Geologia, Instituto de Geociências da UFBA, Rua Caetano Moura 12, Bahia, Brasil

³ Max Planck Institut für Chemie, Abteilung Geochemie, 55020 Mainz, Germany

⁴ Instituto de Geociências, Universidade de São Paulo, 05508-900 São Paulo, Brasil

We have determined Pb isotopes of 12 stratabound, massive and disseminated galenas, sphalerites and pyrites and 3 vein-type galenas from Neoproterozoic carbonate rocks of the Irece Basin, within the São Francisco Craton (SFC) of northeast-central Brazil, in order to reconstruct the processes involved in the formation of the lead-zinc sulfide deposits of the SFC. Pb-isotopic data of all collected sulfides form a linear array, corresponding to a Pb-Pb isochron age of 2138 ± 49 Ma (MSWD=9.2). This obtained Transamazonian age coincides with previously published ages of the felsic volcanic domain of the Rio Itapicuru greenstone belt, with a Pb-Pb age of 2109 ± 80 Ma, with μ l values of 8.0 (Silva, 1992), and U-Pb zircon ages of syntectonic granites with an age of 2107 ± 23 Ma (Gaal et al., 1987). The 2.1 Ga age of the studied sulfides is different to several earlier determined ages of galenas from other contemporary carbonate rocks of the Neoproterozoic sequences of the SFC: 650 Ma (Iyer et al., 1992), 400 to 600 Ma (Misi et al., 1998), 600 and 1100 Ma (Dardenne and Freitas Silva, 1998). Surprisingly, besides the fact that the sulfides are extremely radiogenic, with $^{206}\text{Pb}/^{204}\text{Pb}$ isotope ratios up to 26.99, all data plot far above the Pb evolution curve of Stacey and Kramers (1975). Calculation of a one-stage evolution model obtained a μ l value of 8.1, which is consistent with a crustal source for this lead. Our data support an independent Pb growth, which remains undisturbed even under later diagenetic and hydrothermal conditions. The previously obtained sulfur isotopic analyses of the sulfides from the same samples, indicate relatively uniform heavy $\delta^{34}\text{S}$ values (Kyle and Misi, 1997), which are interpreted by these authors as a result of thermochemical reduction of a limited evaporitic sulfate source by organic matter.

Dardenne MA and Freitas Silva FH, *Workshop: Depósitos Minerais Brasileiros de metais Base, CAPES/PADCT-ADIMB-SBG, Salvador, Proceedings*, 86-93, (1998).

Iyer et al, *Economic Geology*, 87, 437-443, (1992).

Kyle JR and Misi A, *Int. Geol. Rev.*, 39, 383-399, (1997).

Misi A et al, *Workshop: Depósitos Minerais Brasileiros de metais Base, CAPES/PADCT-ADIMB-SBG, Salvador, Proceedings*, 94-101, (1998).

Silva MG, 37 Congresso Brasileiro de Geologia, Soc. Bras. de Geologia, São Paulo, *Proceedings*, 2, 181-182, (1992).

Stacey and Kramers, *EPSL*, 6, 15-25, (1975).

O09 : 4P/22 : PO

AGES OF THE CARIBBEAN AND ECUADORIAN OCEANIC PLATEAUX. GEODYNAMICAL RECONSTRUCTION.

Delphine Bosch (bosch@dstu.univ-montp2.fr)¹,
Marc Mamberti (Marc.Mamberti@imp.unil.ch)²,
Vincent Dupuis (Dupuis@imp.unil.ch)³,
Henriette Lapiere (lapiere@ujf-grenoble.fr)²,
Patrick Monie (monie@dstu.univ-montp2.fr)¹,
Etienne Jaillard (ejaillard@ujf-grenoble.fr)⁴,
Rene Maury (maury@cassis-gw.univ-brest.fr)⁵ &
Mireille Polve (polve@lucid.ups-tlse.fr)⁶

¹ UMR-CNRS 5567, CC066, Place Bataillon, 34095 Montpellier, France

² UPRES A CNRS 5025, Dolomieu, 15 Rue M. Gignoux, 38031 Grenoble, France

³ Univ. Lausanne, BFSH2 Unil-Dorigny, 1015 Lausanne, Suisse

⁴ Orstom, 209-213 Rue Lafayette, 75480 Paris Cedex 10, France

⁵ UMR CNRS 6538, Univ. Bretagne Occidentale, BP 809, 29285 Brest Cedex, France

⁶ UMR CNRS 5563, 38 Rue Des 36 Ponts, Univ. Paul Sabatier, 31400 Toulouse, France

Mafic and ultramafic igneous rocks with oceanic plateau affinities crop out in different places of central and north-western South America (Central Mexico, Caraïbe and Western Ecuador) and have been considered to represent accreted remnants of the Caribbean-Colombian Oceanic Plateau (CCOP). In these areas, Mesozoic E-MORB type tholeiites are the most recognized rocks. But similarly with the Galapagos lavas, few rocks with N-MORB affinity have also been found. In Caraïbe, two belts have been recognized: the Dumisseau Fm in the southwest and the Siete Cabezas Fm and Duarte Complex in the central part. These two belts have been interpreted as corresponding to, at least, two distinct episodes of oceanic plateau building occurring during the Late Jurassic and Upper Cretaceous times. The most important event, in terms of magma production, occurred around 88-86 Ma (Duarte Fm), and was followed by a second, weaker, event at around 70-76 Ma. However, surprisingly younger ages of about 56-50 Ma have been reported within the province. Similarly to the Gorgona komatites, and to basalts from Haiti, Curacao and Costa Rica, these rocks probably result from the melting of the Galapagos plume head. In Ecuador, three distinct suture zones have been individualized: the NNE-trending Andean Cordillera (ca 135 Ma), the eastern part of the Western Cordillera (ca 80 Ma) and the central Occidental Cordillera (ca 58 Ma). On a geochemical point of view, two distinct series can easily be distinguished: one is similar to the 88-86 Ma Duarte magmatic event, and another, constituted by more mafic rocks, probably derive from a ridge-centered or near ridge hotspot, located farther SW of South America, in the SE Pacific. The main objective of the present study is to provide absolute time constraints on the formation and evolution of rocks present within these various suture zones. Determining the main magmatic events occurring in these areas allows the general evolution of the Caribbean-Colombian province to be reconstructed and the comparison between Caribbean and Ecuadorian Oceanic Plateaux. Sm/Nd internal isochrons (RT, plagioclase, pyroxene) on five gabbros from Ecuador and one dolerite from Hispaniola are being processed as well as Pb/Pb isochrons from CPX-rich basalts (separate minerals and whole-rocks) and $^{40}\text{Ar}/^{39}\text{Ar}$ dates. In Hispaniola, $^{40}\text{Ar}/^{39}\text{Ar}$ analyses of magmatic amphiboles from the Duarte Complex provide ages of 86.1 ± 1.3 and 86.7 ± 1.6 Ma suggesting contemporaneity with basalts drilled from the Caribbean Oceanic Plateau which are associated with sediments containing Late Cretaceous faunas. In southwestern Ecuador, a Sm-Nd internal isochron (WR, Plagioclase and Amphibole) from a gabbro from the more mafic section yields an age of 123 ± 13 Ma (MSWD=2.05) related to crystallisation of the cumulate gabbro in the oceanic plateau section. This early Cretaceous age suggests that some of the plateau materials exposed in the CCOP were emplaced during the paroxysmic stage of building of Large Igneous Province at ca 120 Ma. Analyses in progress should bring additional information on the general framework of the CCOP area.