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PROGRAM AND ABSTRACTS

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Pb ISOTOPES APPLIED TO MINERALIZATION FLUID CHARACTERIZATION: THE CANGAS - POCONÉ GOLD DEPOSITS, PARAGUAY BELT, BRAZIL.

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Pb isotopic compositions of ore minerals and their host-rocks provide important constraints on the sources of the hydrothermal fluids, water-rock interactions, and relative chronological information. In addition, Pb isotopes have been applied as a criterion for mineral exploration programs, in order to help identify the economic deposits. We applied this approach in order to identify the source of the fluids responsible for gold mineralization in Mato Grosso State, Brazil, which are associated to the quartz veins; pyrite and oxides, such as magnetite and hematite, can also occur. Two quartz vein systems are present in the area: (i) an older one displaying NE-SW direction, and (ii) the younger and discordant one showing NW-SE direction, which holds the Au mineralization. These veins cut the metasedimentary rocks from the Neoproterozoic Cuiabá Group, Paraguay Belt, at Baixada Cuiabana, close to the Cangas and Poconé cities. The gold content is about 0.7 g/t and is mostly exploited by small mining companies. In order to identify the source of the gold mineralization we collected about 30 samples of quartz veins, 30 samples of regional metasedimentary rocks hosting the veins, and also a few pyrites associated to the Au mineralization from 10 gold deposits. Pb isotopic ratios determined on whole rock samples show a large interval: $^{206}Pb/^{204}Pb$ ranging from 17.892 to 31.657, $^{207}Pb/^{204}Pb$ from 15.570 to 16.521, and $^{208}Pb/^{204}Pb$ between 37.575 and 61.083. These data yielded a regression line suggesting an age of about 800 Ma. Because these rocks are low grade metasedimentary rocks we assume that is a mixing age reflecting the mixing of different source areas of the sediments, so this age could be meaningless. The Pb isotopic ratios determined on the quartz veins show a much narrower interval with $^{206}Pb/^{204}Pb$ ranging from 18.096 to 20.759, $^{207}Pb/^{204}Pb$ from 15.630 to 15.902, and $^{208}Pb/^{204}Pb$ from 37.862 to 46.067. Generally the discordant veins, which are mineralized, show less radiogenic $^{207}Pb/^{204}Pb$ ratios than the concordant ones. Sulfites follow the same pattern defined by the mineralized veins. All isotopic ratios fall above the Pb evolution curve defined by the Stacey and Kramers (1975) model indicating a crustal source for the mineralized fluids. However, the large variation on the Pb isotopic compositions observed on the hosting rocks and in the concordant and discordant quartz veins suggest that 2 sources of fluids are responsible for the Au mineralization. The more radiogenic one could come from the regional metasedimentary rocks of the Cuiabá Group and a less radiogenic one, which was not identified in this study, but it could be represented by the mafic dikes that cut the regional rocks. In addition, our results also demonstrate that Pb isotopes can be a feasible tool to identify the best targets for gold exploration in this region.