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SR AND PB ISOTOPE EVIDENCE FOR THE ORIGIN OF SKARN, SULFIDES AND FLUOR MINERALIZATIONS OF THE ITAOCA GRANITOID, SOUTHEASTERN BRAZIL.

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Several mineralizations are associated with the post-tectonic Itaoca granitoid which is intruded into low-grade late Proterozoic metassedimentary sequences, in Ribeira region southeastern Brazil.

The granitoid comprises monzogranites, quartz-syenites and granites corresponding to a high-potassium peraluminous calc-alkaline trend. The sedimentation of the host metamorphic sequences comprising terrigenous and carbonatic sediments developed during the time period 1.8 to 1.5 Ga. ago.

The skarn type mineralizations are associated with metassedimentary roof- pendant inside the granitoid., which includ schists, pellitic hornfels and marbles. They are characterized by endoskarn, garnet-pyroxene-skarn and garnet-wollastonite-skarn. Scheelite-Powellite and wollastonite are the ore minerals Fluorite and sulfide mineralizations associated to the quartz-veins in fractures or shear zones in the granitoid also occur.

Sr and Pb isotopic analyses were carried out on ore minerals and the host rocks in order to understand the petrogenesis of the mineralizations. 87Sr/86Sr isotopic ratios of the calcite in the skarns (0.7103 to 0.7109) display values very similar with those obtained for calcites from (host) marbles (0.7100). However these values are slightly higher in comparison with the wollastonites(0.7092 to 0.7109).

The Itaoca granitoid yielded a Rb-Sr whole rock isochron age of 676+/-25 Ma, with Sr initial ratio of 0.7097 +/- 0.0001 which is in close agreement with the Sr isotopic initial composition of the skarn mineralizations. This fact suggests that the Sr was derived from the granitoid intrusion responsible for the origin of the skarn. Thus we infer a magmatic origin for the mineralization.

Tardi and/or post-magmatic processes, such as albitization and greisenization probably related to the skarn genesis, took place in the central part of the granitic body, around 620 Ma ago, as supported by a Rb-Sr preliminary isochron. Therefore we assume these processes as contemporaneous with the skarn mineralization.

The Fluorite veins have 87Sr/86Sr isotopic composition of 0.7114, so higher than that of the skarn fluids. In addition, considering that the host metassedimentary sequences include abundant fluorite mineralizations, we consider these supracrustals as the source for the Fluorite.

The galenas from the sulfide- bearing quartz veins have homogeneous Pb isotopic compositions values, and yielded Stacey-Krammers model ages of 1.4 Ga. This age and the corresponding isotopic compositions are in agreement with previous data on Pb-Ag mineralizations in the same host metassedimentary sequence. Thus the Pb of the galena inside the granitoid was leached from this sequence by exotic fluids of metamorphic origin and/or meteoric water.

ORIGIN OF HAWAIIAN BASALTS INFERRED FR ISOTOPES

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Our group at USGS, Denver has undertaken studies of Sr, and Pb isotopic compositions of basalts from Emp Hawaiian volcanoes e.g. (1,2,3) and of xenoliths in the ba (4) in order to obtain isotopic constraints on their or Hawaiian volcanoes evolve similarly and can be subdivided three main stages: shield building tholeiitic stage, caldera-fi alkalic stage, and posterosional (PE) nepherinitic stage. isotopic studies lead us to propose a three component m model for the sources: a mantle plume (Koolau end mem the lithosphere (Kea end member), and a depleted asthenos (posterosional end member).

Hawaiian tholeiites can be explained by mixing of a p with the sea water-altered lithosphere. The iso compositions of PE alkaline basalts are distinct from tho Koolau shield tholeiites and MORB, and are considered to originated from the depleted asthenosphere. High trace ele concentrations in PE basalts are thought to be derived metasomatic fluids from plumes added just prior to eruption.

Isotopic compositions of xenoliths in the Honolulu are, however, similar to those of the host PE ma indicating that they are genetically related and PE b originated from the deep lithosphere, probably the lithosp asthenosphere boundary. The isotopic relationships of N Pb may be generated ~80 Ma which corresponds to the a the lithosphere at Hawaii. The initial ε_{Nd} = ~8.5 fo xenoliths, which is slightly lower than that for the East P MORB, suggests a possibility that the xenoliths and th magma originated from a body that had interme characteristics and intruded into the lithosphere at or ne East Pacific Rise. Such basalts with intermediate characte observed at "off-ridge" seamounts.

We propose that the lithosphere, containing interme composition bodies, moves and approaches the Hawaii spot resulting in the eruption of PE basalts. If such bod not occur close to a volcano, then PE basalts do not erupt

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