Reconstruction of chronological heavy metal marine pollution of Ishigaki Island, the Ryukyus, Japan

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Twentieth century environmental tin, copper and cadmium chronologies for Ishigaki Island, the Ryukyus, Japan have been reconstructed from ICP-MS analysis of annually banded coral, *Porites* sp..

Coral skeletons are considered to be ideal samples to obtain chronological information of marine environment because coral skeletons are steady in sea water, and corals take environmental elements into their $CaCO_3$ skeletons depending on their concentration.

Before chronological analysis, we investigated the method for cleaning samples to remove contaminations. Although the method of Shen and Boyle (1988) is widely accepted, it is too time-consuming and losses too much sample weight because of dissolution.

As a result of experiment, we found that elaborate treatment before crushing samples is enough effective relative to usual method with concentrated treatment after sample crushing.

Chronological analysis showed great and similar changes in concentration of tin, copper and cadmium. This phenomenon is thought to be an influence of paint on the ship. These changes are correlative with the development of Ishigaki Port and political controls on the paint of the ship. The main source of the pollution is thought to have been changed as time as follows;

around 1960	: construction of Ishigaki Port
~ early 1980s	: Japanese ships and fishing net
1990 ~	: foreign ships

The effect of foreign ship out of political control in paint of the ship is especially large in spite of its small number.

PGE concentrations within sulphide mineralization related to ophiolite volcanic sequence

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PGE concentrations in the sulphide mineralization of ophiolite volcanic sequence are investigated in Perlati cooper deposit. The mineralization is developed in basaltic andesite rocks. The ore samples are analyzed using different chemical methods (chemical-spectral, laser photo ionic, atomic absorption spectrometry, emission spectroscopy etc.).

PGE concentrations are recognized in different samples. The most important aspects remain the identification of PGM associations. It is made use of scanning electron microscope and difractometric methods. The chemical preliminary treatment of sulphide phases is applied as well as. The pyrite disintegration facilitated the PGM identification.

The attached pictures show the structural relationships between pyrite and other ore minerals. PGM are associated with copper sulphide ores. The used methods allow the detection of low temperature platinum group minerals (hydroxide etc.). These minerals are observed during the pyrite degradation process. In the selected samples, low temperature dendrite morphology PGM developed after pyrite-marcasite crystals are characteristic.

Several conclusion are drawn:

Pyrite-copper sulphide mineralization located in volcanic rocks of ophiolite formation contains Platinum group minerals.

PGM are related to three metasomatic-hydrothermal and hydrothermal stages: 1. The early stage of medium degree temperatures is characterized by PGM mobilization due to the hydrotherms derived by plutonic sequences. Tipomorphic minerals are isoferroplatinum, sperylite, and cuprite etc., 2. Medium-low temperature mineralization stage replaces and modify the first one. Such type minerals as Cu, Ni, Co sulphoarsenates of Pt, Ru, and Rh are the most typical. A new mineral phase $Cu\ (Co,\ Pt)_2\ S_6$ is evidenced, 3. This stage corresponds to low temperature assemblages (oxides, hydroxides). They are formed during the modification of primary sulphide minerals.

The last mineralization stage is linked to the decrease of sulphur fugacity and the increase of oxygen fugacity. The disintegration of sulphide facilitates the identification of micro disperse and colloidal PGM grains trapped within ore minerals or between their intergranular interstices.