Ni speciation and isotope fractionation in marine ferromangenese deposits

JEFFRY V. SORENSEN[1], BRANDY M. TONER[1], BLEUENN GUEGUEN[2,3] AND OLIVIER ROUXEL[2,3]

[1]University of Minnesota, St Paul, MN, USA (toner@umn.edu, sore0317@umn.edu)
[2]Université de Brest, IUEM, Plouzané, France (bleuenn.gueguen@univ-brest.fr, orouxel@univ-brest.fr)
[3]IFREMER, Département Géosciences Marines, Plouzané, France

Marine ferromanganese deposits have slow deposition rates and laminar growth habits. Variations in major and trace element speciation and isotopic composition of successive layers within the crusts have the potential to retain information regarding ocean chemical conditions. It is thought that Ni can incorporated into the structure of marine ferromanganese deposits such that the Ni is retained over time [1],[2]. The goal of this study is to explore Ni isotope systematics in marine ferromanganese deposits as a tracer for metal sources and chemical conditions at the time of Ni sorption.

Our study pairs stable isotopic fractionation measurements (via MC-ICP-MS [3]) with synchrotron X-ray spectroscopy techniques to identify the local coordination environment of sorbed Ni. This is accomplished by using laboratory generated 2-line ferrihydrite, goethite, and hexagonal-birnessite that have had Ni sorbed under a suite of pH values and Ni concentrations. We're also investigating a range of natural marine deposits such as ferromanganese nodules and crusts from different oceanic basins.

Preliminary findings show that: (1) initial aqueous Ni concentration can affect the fractionation of sorbed isotopes, and (2) pH can influence both the structural location of Ni sorption as well as the fractionation of Ni isotopes. Mineral surface charge and structural properties likely control the extent of Ni isotope fractionation. We hypothesize that in a natural deposits, mineralogy together with Ni sources and enrichment conditions are important parameters controlling Ni isotope signatures.

[1] Peacock & Sherman (2007) *Chemical Geology* **238**, 94–106. [2] Manceau, Tamura, & Marcus (2002) *American Mineralogist* **87**, 1494–1499. [3] Gueguen *et al*. (2011) *Geophysical Research Abstracts* **13**, EGU2011-6890

Early Paleozoic granites in the Jiamusi terrane of the Central Asian fold belt

A.A. SOROKIN[1]*, A.B. KOTOV[2], Y.B. SAL'NIKOVA[2] AND N.M. KUDRYASHOV[3]

[1]Institute of Geology and Nature Management, Blagoveshchensk, Relochny, 1, Russia (*correspondence: sorokin@ascnet.ru)
[2]Institute of Precambrian Geology and Geochronology, St.Petersburg, Russia
[3]Geological Institute of the Kola Sc., Apatity, Russia

In the structure of the eastern part of the Central-Asian fold belt a series of continental blocks (terranes) is distinguished. These are: the Argun, Mamyn, Bureya, Jiamusi blocks (terranes) composed of granitoids of different ages but their age has being remained disputable for quite a long time. At present a series of age datings are obtained (U-Pb method). Basing on that datings we can say with certainty that the Early Paleozoic granitoids are widely developed in this terrane.

In the northeastern part of the Jiamusi terrane we obtained the age of 480±4 Ma granites of Sutara massif, the age of 471±10 Ma of leucogranites of the Kabala massif and the age of 461±5 Ma of quartz syenites of the Durilovsky massif.

Similar age values are also given for granites in the south Jiamusi terrane [1] and for granites in the Argun, Mamyn, Bureya terranes [2-5]. In this connection it cannot be excluded that all above mentioned Early Paleozoic granitiods belong to a single orogenic belt.

Thise study was supported by RFBR (Gr.No 10-05-00172), FEB RAS (Gr.No 09-I-ONZ-09, 09-II-SB-08-007).

[1] Wilde *et al*. (2003) *Prec. Res* **122**, P. 311–327. [2] Sorokin *et al*. (2004) *GCA* **73**, Iss. 13. Suppl. **1**, A1254. [3] Sorokin & Kudryashov (2004) *GCA* **68**, Iss. 11. Suppl. 1. A685. [4] Sorokin *et al*. (2004) *Petrology* **12**, 367–376. [5] Sorokin *et al*. (2010) *Doklady Earth Sciences* **431**, 299–303.