# Results of Re-Os round robin tests

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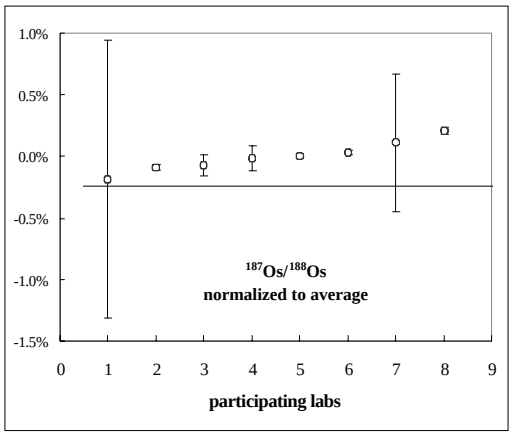
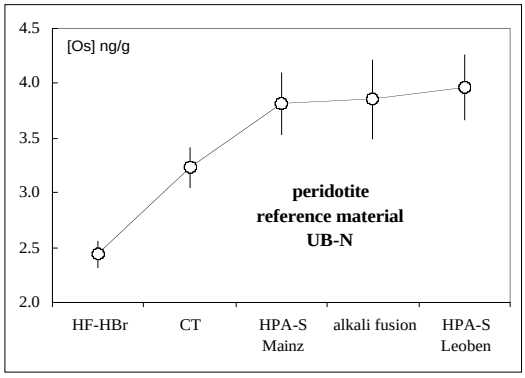
Although it is common place that the use of reference materials (RM) is important for validating analytical methods and thus for assuring the comparability of measurements between laboratories, the use of a common isotope RM or whole rock RM for a variety of matrices in the analysis of the platinum group elements (PGE) or the Re-Os systematics is limited. A common reason given is sample inhomogeneity caused by tiny platinum group minerals (nuggets).




In order to overcome the lack of use of RM and to test if the nugget effect is the only cause of laboratory biases two type of tests were launched: 1) a collaborative trial aimed to demonstrate the necessity of a common liquid (=homogeneous) Os isotope reference material (**LOsST**). To compare different approaches of mass bias and fractionation correction, instruments (MC-ICP-MS, N-TIMS) and uncertainty calculations LOsST was distributed to 19 labs and 2) multiple digestions of a mantle peridotite (**UB-N**) with different digestion techniques (low temperature acid attack, Carius tubes, high pressure asher, alkali fusion) in different laboratories (CRPG, University of Leoben and Max Planck Institut Mainz) with three different spikes.




# Dolomite formation on the Peru Margin: Evidence for microbial activity in the deep biosphere

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During ODP Leg 112, dolomite was recovered as cm-scale nodules or layers in the organic-rich, upwelling-related sediments of the Peru Continental Margin. As shown by laboratory experiments with sulphate-reducing bacteria (Warthmann et al., 2000), the precipitation of this diagenetic mineral under low-temperature conditions is probably mediated by microbial activity. Based on ODP Leg 112 pore-water geochemical studies, the Peru Margin was considered to be an ideal location to study an active deep biosphere. Thus, sites previously drilled during ODP Leg 112 were chosen for re-occupation during ODP Leg 201, which was dedicated to the study of the deep biosphere. As this environment is an appropriate natural laboratory to test the model of microbial mediation of dolomite precipitation and in preparation for dolomite sampling during ODP Leg 201, a pre-cruise geochemical study of dolomite recovered at Sites 680, 681, 684 and 685 was undertaken. Our results were integrated with the earlier work of Suess, von Huene, et al. (1990).

X-ray diffraction analysis revealed that all of the studied dolomite is calcium-rich. Examination of thin-sections showed that the dolomites are very fine grained and often contain molds of dissolved bioclasts. The $\delta^{13}C$ values range from -29 to 14.4 ‰. These carbon isotopic compositions indicate that the dolomite precipitated in zones with different types of microbial activity, i.e., methanogenesis, sulphate reduction and methane oxidation. The $\delta^{18}O$ values of most of the dolomite samples fall in a narrow range from 4.5 to 5.4 ‰, indicating low *in situ* temperatures during precipitation. Apparently, the dolomite formed in different diagenetic zones and at different depths on the Peru Margin.

As anticipated from ODP Leg 112 drilling, extensive amounts of dolomite were cored during ODP Leg 201 with the most abundant quantity recovered at Site 1229 (Site 681), which also revealed the highest bacterial cell counts (Shipboard Scientific Party, 2002). The controls on dolomite precipitation have long been a topic of intensive discussion. Geochemical studies of the ODP Leg 201 dolomite will undoubtedly provide new insights into the microbial processes mediating dolomite precipitation.

## References

Suess, E., von Huene, R., et al., (1990), *Proceedings of the ODP, Scientific Results*, **112**, 95-109.

Warthmann, R., van Lith, Y., Vasconcelos, C., McKenzie, J.A. and Karpoff, A.M. (2000), *Geology* **28**, 1091-1094.