Proxy validation from the culturing perspective: A top down approach

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Laboratory culture experiments offer promise for proxy validation under controlled environmental conditions. Long term culture experiments for benthic foraminifera have proved useful for validation of proxy metal uptake as distribution coefficients [1]. Culture experiments have also helped discern ontogenic variation and feeding effects from environmental variations [2]. However the time and culture reservoir size required for such experiments are daunting [3].

Cultures of planktonic species offer a much more practical approach to proxy identification and validation. Small cultures can be maintained under nearly constant environmental conditions. A new instrumental method allows for the analysis of plankton cultures on a cell by cell basis [4]. Measurable differences in cell physiology occur as a function of macro and micro nutrient concentrations. Results from *E. huxleyi* indicate evidence for variations in the Mg incorporation into pigment porphyrins. This technology is being developed to for field-based instruments and holds promise for tracking signals through the water column as material alters prior to burial.

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Genesis of platinum mineralization in gabbro-dolerites of Pay-Khoy (Russia, Nenets autonomous district)

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Platinum mineralization of dolerites of Pay-Khoy anticlinorium is superimposed on magmatic sulfide mineralization; therefore the formation record of PGE-mineralization has been reviewed by us within the framework of the genesis of sulfide mineralization at late magmatic and hydrothermal stages.

Based on the formation conditions, the PGE enrichment in Pay-Khoy gabbro-dolerites can be distinguished at: 1) isomorphic inclusions in magmatogene sulfides; 2) forming intrinsic minerals from residual fluid melt after crystallization of main sulfide minerals; 3) resedimented in the form of late chalcogenides during postmagmatic transformations. Our observations show that the highest thermal PGE form in the Pay-Khoy gabbro-dolerites represents microinclusions of platinum in sulfides. At decreasing temperature the intrinsic PGE minerals formed, predominantly palladium ones, and gradually the number of corresponding mineral phases increased.

Thus, the platinoids in Pay-Khoy gabbro-dolerites are nonuniformly distributed between three mineral associations: 1) early (magmatic) chalcopyrite-pentlandite-pyrrothine; 2) intermediate (magmatic) sulfide-telluride-sulfoarsenide; 3) late (hydrothermal) arsenide-telluride.

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