Trace metal's occurence forms during diagenesis of the White and Barents Seas' bottom sediments

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A modified method of selective chemical leaching [1] allowed to assess differences in the trace metal's lability during early diagenesis of the Barents and White Seas' Holocene bottom sediments based on the high-resolution Fe, Mn, Al, Cr, Co, Mo, Ni, Cd, Cu, and Pb analysis (centimeter-scale) by use of the ICP-MS. Lithogenic form of Al, Cr and Ni account for the average 97, 86 and 68% correspondingly from total content of each metal. The sum of 3 labile forms of Cu, Cd, Pb, and Co (adsorbed on clays/carbonates, authigenic Fe-Mn oxyhydroxides and organic matter) and their inert (lithogenic) forms contribute approximately equal portions into accumulation of these metals in the White and Barents Seas' bottom sediments. Mn and Mo were found to be the most labile metals: only till 10% in the lithogenic form in the upper 0-6 cm layer, while down the core portion of this form increased progressively. A diagenetic repartition of most elements (except Al, Cr, and Ni) took place in the subsurface sediment intervals of the White and Barents Seas: 6-7 cm and 3-4 cm correspondingly. A detailed record of Mn and Fe behavior within the 18-cm thick layers was documented by their occurence forms [2]. It allowed to reveal that a Mn/Fe ratio in the most labile absorbed/carbonate and authigenic Mn-Fe oxyhydroxides forms has changed during early diagenesis. Values of the Mn/Fe ratio (sum of these forms) were the highest in the 1-2 cm upper oxidized sedimentary layer, decreasing sharply in intervals 6–7 cm in the White Sea and 2–3 cm in the Barents Sea, staying constantly low in deeper sedimentary layers. We suppose Mn/Fe ratio may to be applied as a proxy of the early diagenesis of the bottom sediments.

[1] Tessier *et al*. (1979) Anal.Chem. **51**, 844-851. [2] Demina *et al*. (2017) Geochem. International. **1**, 107-113.