

Distribution of radium-226 along the GA01-GEOTRACES section in the North Atlantic

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We analyzed several natural radionuclides in both the dissolved and particulate phases collected along the GA01 section conducted in the North Atlantic (May-July 2014; Portugal-Greenland-Canada; GEOVIDE project) in the framework of the international GEOTRACES program.

In this work, we studied the distribution of radium-226 (²²⁶Ra, $t_{1/2}=1602$ y) that is often used as a tracer of water masses. We also investigated the barium distribution, barium being often considered as the stable chemical analog of ²²⁶Ra. We test the conservative behavior of ²²⁶Ra and Ba along that section. Optimum multi-parameter (OMP) analysis was thus used to distinguish the relative importance of physical transport (i.e., water mass mixing) from non-conservative processes (sedimentary, river or hydrothermal inputs; uptake by particles) on the ²²⁶Ra and Ba distributions in the North Atlantic. We also report vertical profiles of particulate ²²⁶Ra to track any potential uptake of Ra in the water column. Dissolved ²²⁸Ra activities were determined to confirm or infirm potential sources of Ra to the water column. Finally, the processes responsible for the decoupling between ²²⁶Ra and Ba are discussed.