

Methods used for Radium measurements during ARK-XXII/2

Sampling

Surface water samples (150-300L) from the seawater intake (7m depth) were filtered over 1- μ m polypropylene cartridges, passed over MnO₂ fibre at a flow rate of at most 1 L/min (MOORE, 2008)

Analysis

²²⁴Ra: samples were counted for ²²⁴Ra with delayed coincidence scintillation counting (MOORE and ARNOLD, 1996). For the calculation of counts due to ²²⁴Ra we used the chance coincidence correction, not the alternative procedure based on total counts (MOORE, 2008). The expected error is 8-14% (GARCIA-SOLSONA et al., 2008).

²²⁶Ra and ²²⁸Ra: In the home laboratory, Ra was leached from the fibre (ELSINGER et al., 1982), coprecipitated as BaSO₄ (CUTTER et al., 2010) and counted with gamma spectroscopy for ²²⁶Ra and ²²⁸Ra (MOORE, 1984).

²²⁸Th

We used ²²⁴Ra as proxy for the activity of ²²⁸Th. Beyond the reach of the unsupported ²²⁴Ra from its shelf source, ²²⁴Ra must be in equilibrium with its parent ²²⁸Th.

Other data

Salinity, transmission from CTD bottle data

Fraction pacific water (f_p) and fraction river water (f_r) from Bauch et al. (2011).

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Cutter, G., Andersson, P., Codispoti, L., Croot, P., Francois, R., Lohan, M., Obata, H., and Loeff, M. R. v. d., 2010. Sampling and Sample-handling Protocols for GEOTRACES Cruises. In: www.geotraces.org.

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