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## Determination of Ra-226, Ra-228 and Pb-210 in sedimentary samples of Admiralty Bay - Antarctica

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Natural radionuclides have been widely used as tracers in research of oceanic processes and management of the coastal region. In the marine environment these radionuclides can be used to estimate material flows that occur in the water column as well as in the sediment. In this study we performed a radiochemical characterization of a sedimentary column (1B) of 248 cm collected in the Admiralty Bay, Antarctic Peninsula region. The activity concentrations (mBq.g<sup>-1</sup>) of Ra-226, Ra-228 and Pb-210 obtained in a set of 112 samples of this sedimentary profile were applied in a geochronological model to calculate the sedimentation rate. The methodology included radiochemical separation of Ra-226, Ra-228 by co-precipitation with Ba(Ra)SO<sub>4</sub> and sequential separation of Pb-210 by co-precipitation with PbCrO<sub>4</sub>, followed by counting of gross alpha and gross beta measures in a low background gas flow proportional detector. This method is suitable for environmental measures where the activity concentrations have low levels of radiation from the radionuclides studied. The Ra-226 and Ra-228 was measured after 21 days from the final date of precipitation. The Pb-210 was measured 10 days after the precipitation by the gross beta counting of your Bi-210 decay product. The activity concentration of Ra-226 and Pb-210 were used to estimate the unsupported Pb-210 activity. The activity concentration of <sup>226</sup>Ra ranged from 11±1 (mBq g<sup>-1</sup>) to 48±2 (mBq g<sup>-1</sup>), and the <sup>228</sup>Ra varied from 48±5 (mBq g<sup>-1</sup>) to 155±16 (mBq g<sup>-1</sup>). The activity concentration of <sup>210</sup>Pb ranged from 8±1 (mBq g<sup>-1</sup>) to 458±46 (mBq g<sup>-1</sup>), while unsupported <sup>210</sup>Pb varied from 4±1 (mBq g<sup>-1</sup>) to 434±65 (mBq g<sup>-1</sup>). The activity concentration of Pb-210 has been widely applied in geochronological research. Considering these data it was applied CIC model (Constant Initial Concentration) to determine the sedimentation rate. A sedimentation rate of 0.63±0.02 cm year<sup>-1</sup> was calculated for the sedimentary column (1B).