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Routines of ²¹⁰Po determination in fluvial sediments for dating purpose

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During the last decades, ²¹⁰Pb and its daughter ²¹⁰Po have become widely used radionuclides for sediment dating. In environmental sediments, the total amount of ²¹⁰Pb is given by two components: (a) supported ²¹⁰Pb, produced by radioactive decay of ²²²Rn inside the material, and (b) an unsupported ²¹⁰Pb component derived from ²²²Rn which diffuses into the atmosphere where decays. Subsequently, ²¹⁰Pb is removed by atmospheric precipitation or dry deposition, falling on the land or water surfaces.

The dating method often applies determination of ²¹⁰Po supposing the radioactive equilibrium with ²¹⁰Pb. Utilized analytical procedures generally consists from several basic parts: (a) isolation of measured radionuclide by leaching or total decomposition of sample matrix or polonium distillation; (b) measurement by alpha spectrometry or by liquid scintillation counting; (c) determination of supported ²¹⁰Pb. Our contribution will compare several sample preparation techniques and possibilities of measurement with regards to sample matrix, time and instrumentation requests.

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