

Kiattipong Kamdee 2006: Development of Radioanalytical Technique for Lead-210 in Sediment. Master of Science (Applied Radiation and Isotopes), Major Field: Applied Radiation and Isotopes, Department of Applied Radiation and Isotopes.
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A radioanalytical technique to determine the amount of lead-210 in sediment was developed using electrochemical on silver disc. Considering optimum conditions, the temperature of 80 ± 2 °C, rotational velocity 500 rpm, pH 0.7, deposition time of 4 hrs., gave the highest recovery yield of polonium-210 at 62%, 86.69%, $91.54 \pm 5.95\%$, $91.55 \pm 6.08\%$, respectively. To digest sediment, several acids combinations were used and heat them either in a microwave or on a hot plate. The average specific activities were not much different showing the best result at 5.62 ± 0.22 dpm/g from using $\text{HNO}_3 : \text{HClO}_4 : \text{HCl}$ at 10 : 10 : 10. However, upon testing this technique with two standard sediments IAEA 368 and IAEA 315 the relative accuracy of 107.19 % with non-significant difference was found only with IAEA 368. This indicated its limited use to similar types of sediments to that of IAEA 368 only.

The developed technique was applied to determine the sedimentation rates at two reservoirs in Trat province. At Tuptim Siam Reservoir, the average sedimentation rate was 67.2 ± 24.1 mg/cm²/yr, While Klong Lord Reservoir showed a lot lower of average sedimentation rate at 36.6 ± 12.1 mg/cm²/yr.

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Thesis Advisor's signature

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