

Nikom Prasertchiewchan 2008: Bioaccumulation Kinetics of Mercury-203, Cesium-134, Strontium-85, Zinc-65, Cobalt-57 and Chromium-51 in Cockle (*Anadara granosa*). Master of Science (Applied Radiation and Isotopes), Major Field: Applied Radiation and Isotopes, Department of Applied Radiation and Isotopes. Thesis Advisor: Mr. Somchit Palakas, Ph.D. 125 pages.

In this study, radiotracer technique was applied to determine the bioaccumulation kinetics of mercury-203, cesium-134, strontium-85, zinc-65, cobalt-57 and chromium-51 in cockle (*Anadara granosa*). The laboratory experiments consisted of two parts; the uptake experiments with the activity concentrations of respective radionuclides of 0.2311, 1.7756, 2.3666, 1.370, 0.910 and 0.0521 Bq/ml. Following to the uptake experiment, depuration experiments were conducted under continuous flow seawater system.

The study on bioaccumulation kinetics of these radioisotopes revealed that, no accumulation of cesium-134 and strontium-85 but *A. granosa* could efficiently accumulate mercury-203, zinc-65, cobalt-57 and chromium-51. The uptake biokinetics of cobalt, zinc and chromium showed tendencies to reaching saturation at 30.4, 16 and 26 d and were well fitted to one-component first-order kinetic model with the estimated concentration factors of 729, 89.7 and 23.6, respectively. Bioaccumulation of mercury exhibited linear model with the estimated concentration factors of 166.0. Distribution study of radioisotopes showed that mostly of cobalt and chromium accumulated in shell, mercury mainly accumulated in visceral mass whereas zinc showed the similarity of accumulation in shell and visceral mass.

Regarding depuration experiment, loss of cobalt-57, mercury-203 and zinc-65 from cockle exhibited two-component exponential model with the calculated biological half life of the short components of 5.8, 5.1 and 8 days, respectively, and that of the long components was 124.6, 99.2 and 118.6 days, respectively. Retention efficiency of these radioisotopes was 76.1, 87.7 and 166 %, respectively. Loss of chromium-51 exhibited one-component exponential model with the calculated biological half life of 15 days.

Since, *A. granosa* could efficiently accumulate mercury, zinc, cobalt and chromium with long retention time. In conclusion, this cockle could be used as a bioindicator for environmental monitoring these radioisotopes and for assessment of coastal water quality

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Thesis Advisor's signature

