

Prapamon Seeprasert 2012: Evaluation of Cadmium Uptake in Rice Using Neutron Activation Analysis. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Science. Thesis Advisor: Associate Professor Patana Anurakpongsatorn, D.Tech.Sc. 89 pages.

Rice is one of the most important staple crops in Asia. The prolonged consumption of cadmium contaminated rice has been cause of food borne illness in human. The potential public health risk associated has become of increasing concern. Aims of this study were to study of possibility for using Neutron Activation Analysis (NAA) to analyze cadmium in environment samples, to study cadmium uptake in rice plant and evaluation of cadmium accumulated in rice grain. The assessment of health risk in human consumed the contaminated rice. The result was show that the proper condition was irradiation time for 12 hours at neutron flux 4.47×10^{11} n.cm⁻².s⁻¹ and decay time for 3 days. The validation of measurement was carried out using NIST standard reference material (SRM2711 Montana Soil). The relative error for this method was 1%. The precession was 1% RSD. The linearity of cadmium calibration curve was carried out in the range of 1-9 µg with correlation coefficient of 0.997 and detection limit of 15 mg/kg for soil sample. Uptake ability showed that cadmium in soil was transported, followed by root, stem, leaf, husk and grain, respectively. Accumulation of cadmium in rice grain was higher than standard level at 0.4 mg/kg (CODEX, 2005). The cadmium intaken via rice consumption per week and month were exceeded the tolerance value. The target hazard quotient value revealed the surveillance for human health effects must be conducted. The probability of cancer risk assessment was over the standard value set by U.S. EPA.

Student's signature

Thesis Advisor's signature