別紙様式３（課程博士申請者用）

平成 26 年度 博士後期課程学位論文要旨

学位論文題名（注：学位論文題名が欧文の場合は和訳をつけること）

Distribution of Naturally Occurring Radionuclides and Rare Earth Elements in Environmental Samples at Selected Areas Proposed for Nuclear Power Plant Sites in Thailand: To Establish a Baseline Study

タイの原子力発電所周辺地域における環境試料中に含まれる天然放射線核種と希土類元素の分布: ベースラインの確立に関する研究

学位の種類： 博士（放射線学）
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注：1ﾍﾟｰｼﾞあたり 1,000 字程度（欧文の場合 300 ワード程度）で、本様式 1～2ﾍﾟｰｼﾞ（A4 版）程度とする。

The main of this study is to establish a baseline concentration for naturally occurring radionuclides, rare earth elements and some toxic metals in environmental samples e.g. soils, marine sediments and selected plants and to estimate radiological risk. This study was carried out at four provinces in southern part of Gulf of Thailand. These study areas have been proposed as potential sites to set up nuclear and/or coal-fired power plants. Elemental and activity concentrations in samples were determined using gamma spectroscopy and inductively coupled plasma mass spectrometry (ICP-MS). A methodology for rapid purification of uranium in soil and marine sediment samples base on anion exchange and extraction chromatography was developed. Uranium isotope ratios were measured using thermal ionization mass spectrometer (TIMS). $^{234}U/^{238}U$ and $^{235}U/^{238}U$ reflect the natural origin of the uranium.

Radiological hazard parameters including radium equivalent activity (Ra_{eq}), absorbed dose rate (D), annual effective dose equivalent ($AEDE$), and external hazard index (H_{ex}) were estimated by taking into account activity concentration of ^{238}U, ^{232}Th and ^{40}K in soil and marine sediment samples. The values of these parameters were comparable to worldwide values and were below permissible limit. Therefore, soil and marine sediments samples are unlikely to pose radiological health risk to the people living in those areas.

Results of this study can be provided as a baseline data for elemental concentration in soils and sediments surrounding the proposed power plant sites. The baseline study prior to set up the projects is useful primarily as reference level in assessing any consequences of energy development in Thailand. It is beneficial not only for future environmental radioactivity monitoring but also radiological risk assessment. This study can also help to direct people into a proper perspective on the source of radiation exposure before and during starting up nuclear power plant in their living environment.