

VIII-I. SUMMARY OF RESEARCH ACTIVITIES

VIII-I-1. MEETINGS AND SEMINARS

Specialists' Meetings Held in the FY 2013

1. Issues in Radiogenic Circulatory Disease and Cataracts
2. Proceedings of Workshop on Reactor Physics
3. The Results and Future Prospects of Activation Analysis Using KUR"
4. Workshop on Materials Irradiation Effects and Applications
5. Proceedings of the Specialist Research Meeting on Science and Engineering of Unstable Nuclei and Their Uses on Condensed Matter Physics III
6. Proceedings of the Specialist Research Meeting on "Abnormal Protein Aggregation and the Folding Diseases, and their Protection and Repair System" (VI)
7. Proceedings of the Symposium on Present and Future Statuses of Criticality Safety Research
8. Novel Development of BNCT - From Special to General -
9. Proceedings of the Specialists' Meeting on the Chemistry and Technology of Actinide Elements Proceedings of the Specialist Research Meeting on Science and Engineering of Unstable Nuclei and Their
10. Technological Development, Operation, and Data Analysis of Radiation Mapping Systems in Affected Area of Nuclear Accident
11. Proceedings of the Specialist Meeting on Positron Annihilation Study for Science and Engineering 2013
12. Proceedings of the Specialists' Meeting on Radioactive Wastes Management
13. Neutron Imaging

Workshops Organized in the FY 2013

1. Promotion of Leading Research toward Effective Utilization of Multidisciplinary Nuclear Science and Technology
2. Workshop of Next Neutron Source for Beam Utilization after KUR II

Special Meeting Held in the FY2013

Meeting on the Future Project of the Kyoto University Research Reactor Institute

VIII-I-2. COLLABORATION RESEARCH AND VISITING SCIENTISTS

Visiting Scientists

The number of project researches	11
(The number of allotted research subject)	(101)
The number of general joint researches	126
The total man-days of visiting scientists	881

VIII-I-3. EXPERIMENTAL RESEARCH

VIII-I-3-1. LIST OF PROJECT RESEARCH

- [Project 1] Application Studies on Effective Use of F-Elements
- [Project 2] Project Research on Science and Engineering of Unstable Nuclei and Their Uses on Condensed Matter Physics
- [Project 3] Project Research on the Abnormal Aggregation of Proteins by Post-Translational Modifications, and Study of Repair Mechanism
- [Project 4] Analyzing Tumor Microenvironment and Exploiting its Characteristics for Controlling Malignant Solid Tumors and Distant Metastatic Potential
- [Project 5] Direct Observation of the Proton or Protonation in a Protein Molecule by Neutron and High Resolution X-ray Joint Analysis

- [Project 6] Project Research on the New Applicant Development Using the Characteristics of the Particles from the Neutron Capture Reaction
- [Project 7] Project Research on Development of Scattering Spectrometers Utilizing Small and Medium Class Neutron Source
- [Project 8] Behavior of Radioactive Nuclides in Intense Radiation Fields in Accelerator Facilities
- [Project 9] Irradiation Effects on Nuclear Advanced Materials Irradiated by Particles with High Energy
- [Project 10] Creation of Unique Neutron Irradiation Experiments Using B-2 Beam Hole of KUR
- [Project 11] Development on Neutron Imaging Application

VIII-I-3-2. LIST OF COLLABORATION RESEARCH

1. Slow Neutron Physics and Neutron Scattering

- CO1-1 Development of a Large-Scale Flexible Neutron Supermirror Sheet (25046)
- CO1-2 Development of Neutron Devices for Fundamental Physics (25068)
- CO1-3 Measurement of the Pulse Shape of Monochromated Neutron Beam from Kyoto University Accelerator Driven Neutron Source (KUANS) (25076)
- CO1-4 Neutron Reflectivity Measurement of NiC/Ti Supermirror with Ion Bombardment (25096)

2. Nuclear Physics and Nuclear Data

- CO2-1 Measurement of Gamma Ray and Neutron Spectrum of Curium Isotope (2) (25013)
- CO2-2 Development of Absolute Measurement Method for Epi-thermal Neutrons Using a LGB Scintillator (25050)
- CO2-3 Experimental Study on Non-Destructive Assay with a Pulsed Neutron Source (25079)
- CO2-4 Measurement of Prompt Gamma-rays for Thermal-Neutron Induced Fission of ²³⁵U (25120)
- CO2-5 Neutronic Characteristics of Lead-Bismuth in KUCA A Core for Accelerator-Driven System (CA25101)

3. Reactor Physics and Reactor Engineering

- CO3-1 Activation Evaluation of Metals in Nuclear Power Plants (25052)
- CO3-2 Development of In-reactor Observation System Using Cherenkov Light (V) (25073)
- CO3-3 Development of a Novel Neutron Spectrometer Using a Single Bonner Sphere with Onion-Like Structure (CA25102)
- CO3-4 Development of Subcriticality Measurement for Accelerator-Driven Reactor (VIII) (CA25103)
- CO3-5 Neutron Induced Gamma Ray Spectroscopy for Subcritical Assemblies Containing Stainless Steel (CA25104)
- CO3-6 Basic Experiment for Kinetics Analysis in Sub-Critical State (CA25105)
- CO3-7 Basic Experiment on the Variation of Beam on Accelerator-Driven System (CA25106)
- CO3-8 Subcriticality Measurement Experiment Using Inherent Neutron Source (2) (CA25108)

4. Material Science and Radiation Effects

- CO4-1 Study of Intense Terahertz Light Source Based on Superimposing Coherent Diffraction Radiation (25009)
- CO4-2 Metal Ion Adsorption by Acrylic Acid Grafted PET Films Prepared by γ Irradiation (25012)
- CO4-3 Structural Determination by Ultra Small Angle Light Scattering of Self-Assembled Complexes to Perform Small Angle Neutron Scattering Experiments (25017)
- CO4-4 Current Status of B-3 Beam Port of KUR (25018)
- CO4-5 Sub-Terahertz Absorption of Ionic Liquid (25021)
- CO4-6 Synthesis of Metal Nanoparticles under the Gamma-ray Irradiation Field (25022)

- CO4-7 Radiation-Induced Luminescence for Applying to Retrospective Dosimetry (25024)
- CO4-8 Absorption Spectroscopy with the Coherent THz Radiation from Linac Electron Beams (25032)
- CO4-9 ⁵⁷Fe Mössbauer Studies of Superconducting Sr₂VFeAsO_{3-d} and Heavy Fermion CeRu_{1-x}Fe_xPO (25033)
- CO4-10 Characterizations of Dynamic Behavior for Organic Solar Cells under High-Energy Photons and Secondary Electrons by ⁶⁰Co Beams (25034)
- CO4-11 Tritium Release from Li₄SiO₄ Ceramic Breeder Materials Prepared by Melt-Spraying Method (25045)
- CO4-12 Polarization Degree of Linearly Polarized Coherent Transition Radiation Emitted from Wire-Grid Radiators (25054)
- CO4-13 Effects of High Energy Particle Irradiation on Hydrogen Retention in Refractory Metals (25055)
- CO4-14 γ -Ray Irradiation Effects for Various Metal Complexes with Cage-Type Silsesquioxane (25062)
- CO4-15 Dependence of Irradiation Damage Density on Tritium Migration Behaviors in Li₂TiO₃ (25069)
- CO4-16 Complex Structure of Ions Coordinated with Hydrophilic Polymer. 14. (25071)
- CO4-17 Thermoresponsive Porous Binary Gels Prepared through γ -Irradiation (25083)
- CO4-18 Design and Preparation of the Electrochemical Cell for the Study of the Electrical Double Layer at the Electrochemical Interfaces of Ionic Liquids Using Neutron Reflectometry (25088)
- CO4-19 ⁵⁷Fe Mössbauer Study of a Reactive Diiron Paddlewheel Unit in a Porous Coordination Polymer (25098)

5. *Geochemistry and Environmental Science*

- CO5-1 Study of Earth and Planetary Matters by Thermoluminescence Reconstruction of East Asia (25010)
- CO5-2 Characteristics of Calcite Thermoluminescence Studied for Paleoenvironmental (25028)
- CO5-3 Atmospheric Effect of the Particles Emitted From the Burning the Waste Contaminated in Radiative Cesium (25029)
- CO5-4 Study on Fission Track Ages of Sedimentary Rocks in Shimanto Accretionary Complex (25044)
- CO5-5 Study of Cosmogenic Nuclides by Using of Activation Analysis (25047)
- CO5-6 A Study on Redox Sensitive Elements in the Sediments at Dredged Trenches in Tokyo Bay by Instrumental Neutron Activation Analysis (25053)
- CO5-7 ⁴⁰Ar/³⁹Ar Age of Volcanic Tuffs in the Eastern Africa III (25061)
- CO5-8 Neutron Activation Analysis of Mantle Xenolith Samples (25066)
- CO5-9 Measurement of Environmental Radioactivity and Heavy Metal in Seaweed Samples in Recently (25070)
- CO5-10 Trace Amounts of Halogens (Cl, Br and I) in 16 U.S. Geological Survey Geochemical Reference Materials (25074)
- CO5-11 Determination of Abundance of Rare Metal Elements in Seafloor Hydrothermal Ore Deposits by INAA Techniques-3: Evaluation of Analytical Accuracy (25077)
- CO5-12 Decontamination of Radioactive Cesium and Loss of Trace Elements in Soil (25095)
- CO5-13 Neutron Activation Analysis of Iron Meteorites (25097)
- CO5-14 Activation Analysis for Soils of Hiroshima·Nagasaki City and Gamma-ray Exposure due to Neutron-Induced Radionuclides by Atom Bomb (25105)
- CO5-15 Long-Term Effects of Radionuclides Originating from the Fukushima Nuclear Power Plant Accident in Airborne Particulate Matters (25108)

- CO5-16 Volcanic and Tectonic History of Philippine Sea Plate (South of Japan) Revealed by $^{40}\text{Ar}/^{39}\text{Ar}$ Dating Technique (25111)
- CO5-17 Tracing Water in the Deep Earth by Ultrasensitive Halogen Analysis Using Neutron Irradiation and Noble Gas Mass Spectrometry (25112)
- CO5-18 I-Xe Dating of Brecciated Meteorites: Elucidation of Formational Environment for Planetesimals in the Early Solar System (25113)
- CO5-19 Ar–Ar Age Determination of Petit-spot, a New Kind of Volcano (25115)

6. Life Science and Medical Science

- CO6-1 Localization Estimation of Abasic Sites in DNA Irradiated with Ionizing Radiation under a Cell-Mimetic Condition (25001)
- CO6-2 The Mechanism of Radiation Induced Bystander Effect (25003)
- CO6-3 Specificity of DNA Damage Induced by Neutron Radiation (25064)
- CO6-4 Multi-Element Neutron Activation Analysis of Canadian Food Samples by Short Irradiation (25065)
- CO6-5 The Role of Human Oxidation Resistance 1 (OXR1) in Cellular Response to Radiation (25084)
- CO6-6 Establishment of Innovative Combination Therapy with Boron Neutron Capture Therapy and Immune Therapy (25104)

7. Neutron Capture Therapy

- CO7-1 In Vivo BNCT Effect of High Boron Content Liposomes (25005)
- CO7-2 Establishment of QA/QC for BNCT Neutron Irradiation Field (II) (25007)
- CO7-3 Development of an Advanced Optical Fiber Type Neutron Detector (25008)
- CO7-4 Boron Neutron Capture Therapy for Lung Metastasis and Biodistribution of p-borono-L-phenylalanine in Lung of Human Clear Cell Sarcoma (CCS)- bearing Animal Model (25011)
- CO7-5 BNCT for Head and Neck Cancer (25015)
- CO7-6 Study on the Generation of Gamma-rays from Lanthanide Oxide Phosphor by Neutron Irradiation and the Effect on the Living Cells (25016)
- CO7-7 To Conquer the Clinically Relevant Radioresistant Cell Tumors Targeting Tumor Endothelial Cells (25019)
- CO7-8 Boron Neutron Capture Therapy with Bevacizumab May Prolong the Survival of Recurrent Malignant Glioma Patients (25026)
- CO7-9 Examination of the Usefulness as the New Boron Compound of ACBC-BSH for Boron Neutron Capture Therapy (25030)
- CO7-10 Development of Novel Boron Compounds for BNCT (25036)
- CO7-11 Radiobiological Response of Combination Effect, with Boron and Gadolinium Neutron Capture (25041)
- CO7-12 Cancer Therapy of C6 Glial Tumor Model by BNCT and PDT Sensitized by a Boron-10 Rich Porphyrin Derivative (Compound- ^{10}B) (25043)
- CO7-13 Evaluation of Biocompatible Polylysine Bearing BSH as a Polymeric Agent for Boron Neutron Capture Therapy (25051)
- CO7-14 Characteristics of Radiation-Resistant Real-Time Neutron Monitor for Accelerator-Based BNCT (25057)
- CO7-15 Application of B $_4\text{C}$ Nanoparticles for Boron Neutron Capture Therapy (25078)
- CO7-16 Investigation of Intracellular Boron Distribution by High Position Resolution Alpha Autoradiography (25080)
- CO7-17 Design and Preparation of Boron Cluster-Containing Nanoparticles for High Performance Nanoparticle Assisted Boron Neutron Capture Therapeutics (25085)

- CO7-18 Precise Determination of Boron Location in Tissue via E-Tracks (25086)
- CO7-19 A Case Report: Current Status of GBM 33Mo after BNCT (25087)
- CO7-20 Clinical Study on Boron Neutron Capture Therapy (BNCT) (25089)
- CO7-21 Application of Gd-DTPA-Incorporated Calcium Phosphate Nanoparticles as Neutron Capture Therapy Agent (25099)
- CO7-22 Neutron Dose Estimation & Evaluation on Neutron Capture Therapy for Hepatocellular Carcinoma Using Intra-Arterial Administration of Boron-Entrapped Water-in-Oil-in-Water Emulsion (25100)
- CO7-23 Application of B⁴C particle to Boron Neutron Capture Therapy (250101)
- CO7-24 Microdosimetry of Neutron Field with Low-Enriched Uranium at Kyoto University Reactor (25106)
- CO7-25 Boron Neutron Capture Therapy for Recurrent Head and Neck Cancer (25109)

9. TRU and Nuclear Chemistry

- CO9-1 Study on the Production and Chemical Separation Methods of Technetium as an Assay Tracer (25039)
- CO9-2 Adsorptivity of Caprolactam Resin Irradiated by γ -Ray in HNO₃ (25058)

12. Others

- CO12-1 Analysis of Heavy Metal Elements in Chinese Medicine (25004)
- CO12-2 Terahertz Absorption Sepctrum of Carbohydrates Including Water (25006)
- CO12-3 Neutron Activation Analysis for Hafnium in Hafnium Oxide Thin Films (25020)
- CO12-4 Basic Research on Radiation Tests Suitable for Nano-Satellites (25025)
- CO12-5 Photon Activation Analysis of Fluorine with Bremsstrahlung at the KURRI-Linac (25037)
- CO12-6 Mössbauer Microspectrometer Using MCX and Estimation of γ -ray Focus Size (25038)
- CO12-7 Evaluation of Multiwire-Type Two-Dimensional Neutron Detector with Individual Line Readout (25042)
- CO12-8 Precise Determination of Cl in ABS Resin by Instrumental Neutron Activation Analysis Using Internal Standardization (25049)
- CO12-9 Structural Analysis of Oil-Compatible Concentrated Polymer Brushes by Means of Neutron Reflectometry (25060)
- CO12-10 Mössbauer Studies on Reversible O-O Bond Scission of Peroxodiiron (III) to High-Spin Oxodiiron (IV) with a BPG₂E Ligand (25082)
- CO12-11 Test of a Microcell Multi-Wire Proportional Chamber for a Muon-Electron Conversion Experiment, DeeMe (25119)
- CO12-12 Development of Wide Dynamic Range Neutron Flux Monitor Having Fast Time Response (CA25107)