VIII-I. SUMMARY OF RESEARCH ACTIVITIES

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VIII-I-1. MEETINGS AND SEMINARS

Specialists' Meetings Held in the FY 2011

1. Proceedings of the Specialists' Meeting on Radioactive Wastes Management
2. Crossing Point of Radiation Biology and Radiation Protection -An Approach to Risk Science by Studies of Low dose and Low dose Rate Radiation
3. Chemistry and Technology of Actinide Elements
4. Proceedings of the Workshop on Monitoring of Environmental Radioactivity and Studying the Measurements and Kinetics of Radioactive Materials in the Environment
5. The Latest Study on Analysis of Trace Amount of Elements using Activation Analysis
6. Neutron Imaging
7. Research & Development for Analysis Method of SANS
8. Proceedings of the Specialist Meeting on Positron Annihilation Study for Science and Engineering 2011
9. Meeting for Neutron Capture Therapy using Reactor- and Accelerator-based Neutron Sources
10. Symposium on the Present and Future Statuses of Criticality Safety Research
11. Proceedings of the Specialist Research Meeting on "Science and Engineering of Unstable Nuclei and Their Uses on Condensed Matter Physics"
12. Proceedings of the 5th Specialist Research Meeting on MIEZE/N(R)SE Spectroscopy
13. Study on radiation Safety Control at Accelerator Facility
14. Abnormal Protein Aggregation and the Folding Diseases, and Their Protection and Repair System (IV)
15. Development and Application of Useful Radiotracers

Workshops Organized in the FY 2011

1. Workshop on KUR Utilization and New Neutron Source
2. Proceedings of the Specialist Research Meeting on Development and Applications of Devices for Neutrons V
3. Workshop on Materials Irradiation Effects and Applications 2011

Special Meeting Held in the FY2011

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	12
(The number of allotted research subject)	(99)
The number of general joint researches	92
The total man-days of visiting scientists	1185

VIII-I-3. EXPERIMENTAL RESEARCH

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

[Project 1]	Trace Elemental Analysis Using Research Reactor
[Project 2]	Deuterium Exchages in the Biological Macromolecules for a Neutron Analysis
[Project 3]	Analyzing Tumor Microenvironment and Exploiting its Characteristics for Controlling Malignant Solid Tumors
[Project 4]	The Effect of Boron Neutron Capturetreatment Targeting Tumor Endohtelial Cells of Clinically Relevant Radioresistant Tumors
[Project 5]	Studies on Radiation Safety Control at Accelerator Facilities

[Project 6] Project Research on the New Applicant Development using the Characteristics of the Particles from the Neutron Capture Reaction

[Project 7] The Origin of Radiation Carcinogenesis is not DNA Damage

[Project 8] Irradiation Effects on Microstructural Evolution in Materials Irradiated by Particles with High Energy

[Project 9] Application Studies on Effective Use of F-Elements

[Project10] Project Research on Science and Engineering of Unstable Nuclei and Their Uses on Condensed Matter Physics

[Project 11] Project Research on the Abnormal Aggregation of Proteins by Post-translational modifications, and Study of Repair Mechanism

[Project 12] Development on Neutron Imaging Application

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

1. Slow Neutron Physics and Neutron Scattering

CO1-1 Design and Preparation of the Electrode Film for the Study of the Ion Distribution at the Electrochemical Interfaces of Ionic Liquids Using Neutron Reflectometry (23019)

CO1-2 Novel Analyzing Method of Amount of Hydrogen in Metal Alloy Utilizing Small-Angle Neutron Scattering (23030)

CO1-3 $^{40}Ar/^{39}Ar$ Age of Volcanic Tuffs in the Eastern Africa (23038)

CO1-4 Development of Neutron Accelerator for UCN Focusing (23046)

CO1-5 Development of Neutron-Beam Focusing Device (23050)

CO1-6 Observation of Influence of Absorbing Layer on Neutron Reflectivity (23054)

CO1-7 Improvement of KUR-IBS as a Large-Scale Neutron Supermirror Fabrication Machine (23055)

CO1-8 Performance Test of Supermirrors for a Guide Element Fabricated in the JAEA (23066)

2. Nuclear Physics and Nuclear Data

CO2-1 Prompt γ-ray Measurement of $^{35}Cl(n,\gamma)$ Using Total Absorption Type Ge Detector (23020)

CO2-2 Development of New Calibration Method for a Neutron Detector using a Pulsed White Neutron Source from the KURRI-LINAC (23044)

CO2-3 Neutron Capture Cross Section Measurement on ^{243}Am with a Pair of C_6D_6 Detectors (23048)

CO2-4 Reaction Rate Distributions in the Thorium-Loaded Accelerator-Driven System with 14 MeV Neutrons at the Kyoto University Critical Assembly (CA23102)

CO2-5 Measurements of Thorium-Fueled Core Characteristics and Replacement Worth of Thorium Plates to Aluminum Plates (CA23105)

CO2-6 Development of Subcriticality Measurement for Accelerator-Driven Reactor (VI) (CA23108)

3. Reactor Physics and Reactor Engineering

CO3-1 Development of In-reactor Observation System Using Cherenkov Light (III) (23070)

CO3-2 Measurements of Angular Distribution of Epi-thermal Neutrons in Reactors Using the Compact Directional Neutron Detector (CA23101)

CO3-3 Measurement of Neutron Generation Time by Pulsed Neutron Source (CA23103)

CO3-4 Measurements of Thorium-Fueled Core Characteristics and Replacement Worth of Thorium Plates to Aluminum Plates (1) (CA23104)

CO3-5 Experiments on Subcriticality Measurement Using Neutron Source Multiplication Method Based on Deteced-Neutron Multiplication Factor (CA23106)

CO3-6 Measurement of Gamma Ray Spectrum for Estimation of Subcriticality Index (CA23107)

CO3-7 Reactor Noise Experiments with Time Series Data by High Time Resolution (2) (CA23109)

4. Material Science and Radiation Effects

CO4-1 Small Angle Neutron Scattering Study of Surfactant Micelle Structures by Utilizing KUR-SANS (23008)
CO4-2 Radiation-induced Luminescence for Applying to Retrospective Dosimetry (23010)
CO4-3 Neutron Irradiation Effects of Superconducting Magnet Materials at Low Temperature (23013)
CO4-4 Absorption Spectroscopy with the Coherent THz Radiation from Linac Electron Beams (23022)
CO4-5 State Analysis of Novel Gold Clusters by ^{197}Au Mössbauer Spectroscopy (23024)
CO4-6 Coherent Excitation of Superionic Conduction (23026)
CO4-7 One-dimensional Imaging Microscopy of a Cancer Tissue in the Terahertz Region using Coherent Transition Radiation (23027)
CO4-8 Trial use of KUR-SANS for Characterizing Precipitates in Steels (23028)
CO4-9 Encapsulation of Hydrogen Atom into Metal Complexes using Silsesquioxane Ligand with Cage Structure (23031)
CO4-10 Tritium Release Behavior from Li_4SiO_4 doped with Ti (23033)
CO4-11 Neutron Irradiation Effect on Superconducting Magnet Materials (23043)
CO4-12 Complex Structure of Ions Coordinated with Hydrophilic Polymer.12:Stain Growth on Composite under DC Field (23047)
CO4-13 Variation of Polarization of Coherent Transition Radiation with Radiator (23051)
CO4-14 Release Kinetics of Tritium Generated in Lithium-enriched $Li_{2+x}TiO_3$ by Thermal Neutron Irradiation (23057)

5. Geochemistry and Environmental Science

CO5-1 Determination of Particulate, Inorganic and Organic Gaseous Halogens in the Atmosphere (23002)
CO5-2 Radiometric Dating for Paleoemvironmental Study of East Asia (23003)
CO5-3 Determination of Trace Amount of Cl, Br and I in Sedimentary Rock Samples (23012)
CO5-4 Study of Earth and Planetary Matters by Thermoluminescence (23016)
CO5-5 Size Distribution of Metal Elements in the Atmospheric Aerosols at Sakai, Osaka (23021)
CO5-6 Estimation of Fe Vacancies of Natural Magnetite in San'in Coast Region by Mössbauer Spectra (23029)
CO5-7 Determination of Abundance of Rare Metal Elements in Seafloor Hydrothermal Ore Deposits by INAA Techniques (23039)
CO5-8 ESR Study on γ-Irradiated Agricultural Wastes for Arsenic Absorber (23041)
CO5-9 Measurement of Environmental Radioactivity and Heavy Metal in Seaweed Samples (23041)
CO5-10 Cathodoluminescence Study of Nanodiamond Formation in Meteorites (23059)
CO5-11 Determination of the Uranium Content in Moldavite for the Absolute Evaluation of Fission-track Ages (23067)
CO5-12 Determination of Nb and Zr in Geological Standard Rock Samples by Instrumental Photon Activation Analysis (23074)
CO5-13 Determination of Iron and Manganese in the Sediments under Hypoxia with High Time Resolution (23075)
CO5-14 Instrumental Neutron Activation Analysis of Crystalline Schist Boulders from the Upper Cretaceous Onogawa Group, Eastern Kyushu, Japan (23077)
CO5-15 Natural Analogue Study Using Trace Elements in Rock Alteration Zones (23080)
CO5-16 Comparison of Determination Accuracy of NAA in KUR and JRR-3 (23081)
CO5-17 Geochemical Mapping for the Upper Ara-river System Area, Saitama Prefecture by Neutron Activation Analysis (23083)

6. Life Science and Medical Science

CO6-1 Neutron Activation Analysis for Trace Elements in Scalp Hair of Patients with ALS (23007)
CO6-2 Structure Specificity of Radio-Induced Biomolecule Damage and Its Effect on Radio-Biological Consequence (23011)
CO6-3 Determination of Trace Elements in Organs of Zn-deficient Mice (23023)
CO6-4 New Reagents for Disulfide-Coupled Protein Folding (23049)
CO6-5 Combination Therapy of BNCT and PDT Sensitized by A Boron-Porphyrin Derivative in a Glial Cancer Cell Line (23073)

7. Neutron Capture Therapy

CO7-1 Irradiation Characteristics of D2O Facility in KUR with Low-enriched Uranium Fuel (II) (23006)
CO7-2 Short-Term Outcome of BNCT for Human Clear Cell Sarcoma in Mouse Model (23009)
CO7-3 Enhanced the Effect of Boron Neutron Capture Therapy: Design of Boron-containing Nanoparticles with Highly Tumor-accumulating Character (23015)
CO7-4 Development of Novel Boron Compounds for BNCT (23017)
CO7-5 Fluorescence-labeled closo-dodecaborate Lipid: Synthesis and its Liposome Formation for in vivo Imaging Targeting to Tumor on BNCT (23018)
CO7-6 Basic Investigation of BNCT with Novel Boron Compound for Malignant Pleural Mesothelioma Cells (23025)
CO7-7 Pilot Application of Gadrinium-Platinum Nanomicelles to Gd- Neutron Capture Therapy (23034)
CO7-8 Boron Neutron Capture Therapy for Advanced Head and Neck Carcinoma (23035)
CO7-9 Carboranyl Glucose and Ribose Derivatives for BNCT (23036)
CO7-10 BNCT Case Report of Malignant Brain Tumor 2011 (23037)
CO7-11 Hyaluronan-Conjugated Liposomes as Carrier for Oral Squamous Cell Carcinoma in Boron Neutron Capture Therapy (23042)
CO7-12 Boron Neutron Capture Therapy for Malignant Pleuritis (23052)
CO7-13 Intracellular Distribution of BSH-Appended Polyamine at Tumor Tissue of Colon 26 Carcinoma-Bearing Mice (23056)
CO7-14 Boron Neutron Capture Therapy for Malignant Brain Tumors Using Epithermal Neutron (23060)
CO7-15 High LET-radiation Can Overcome Radioresistance Of Glioma Stem-Like Cells Which are Radioresistant to Low LET-radiation (23061)
CO7-16 The Tumor Control Effect by the Sonoporation in BNCT (23063)
CO7-17 Clinical Studies on BNCT for 4 Cases of Head and Neck Cancer (23064)
CO7-16 Basic Cell Survival Analysis of New Boron and Gadolinium Compounds for Neutron Capture Therapy (23078)

9. TRU and Nuclear Chemistry

CO9-1 Stability of Silica-supported Monoamide Resins with Selectivity to U(IV) and U(VI) Against γ-ray Irradiation in HNO_3 (23040)
CO9-2 Study on the Production and Chemical Separation Methods of Technetium as an Assay Tracer (23076)

10. Health Physics and Waste Management

CO10-1 Activation Analysis for Soils of Hiroshima City and Gamma-ray Exposure due to Neutron-induced Radionuclides by Hiroshima Atom Bomb (23005)
CO10-2 Damage of USB Semiconductor Memory by Radiation Exposure (23062)
CO10-3 Evaluation of Gold in Melting Residue of the Municipal Wastewater Sludge (23068)

11. *Accelerator Physics*

CO11-1 Coherent Terahertz Spectroscopy of Bile Acids by L-Band LINAC (23001)
CO11-2 Evaluation and Verification of Photon Irradiation Field at KURRI-LINAC (23004)
CO11-3 Developments of Coherent Synchrotron Radiations for Terahertz-wave Spectrophotometry by Compton Backscattering Using KURRI-LINAC (23069)

12. *Others*

CO12-1 Thickness and Density of Adsorbed Additive Layer on Metal Surface Evaluated by Neutron Reflectometry (23014)
CO12-2 Neutron Activation Analysis on Hafnium Oxide Films (23071)
CO12-3 A Brain Radiation Necrosis Model in Laboratory Animals (23072)
CO12-4 Characterization for U-type and straight-type ^{3}He PSD (23079)
CO12-5 Evaluation for Radioactive Inventory of Structural Materials Induced by Neutron Activation (23082)

VIII-I-3-3. LIST OF ORIGINAL RESEARCH

OR1 Reducing Intratumor Acute Hypoxia through Bevacizumab Treatment, Referring to Distant Metastatic Potential