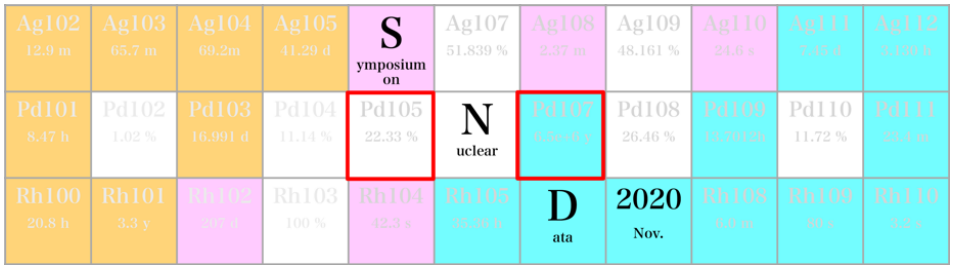

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Roles and Current Status on Reactor Physics Experiment in Research Reactors

Nuclear reactors are mainly categorized as two parts: a commercial power reactor; a test and research reactor for generating electric power and conducting research of radiation utilization, respectively. Of two reactors, main roles of the test and research reactor are to conduct the research and development of nuclear engineering and radiation detection fields with the use of radiation, including neutron, alpha-ray, beta-ray, gamma-ray, and so on, and to contribute to the education of young generation. Many research reactors are importantly equipped with experimental facilities to research objectives, including irradiation holes, neutron beams and spectrum shift changers, although the commercial reactors insufficiently meet the items. An index of classification of research reactors is to provide a wide range of neutron spectrum and thermal reactor power, with the combined use of nuclear fuel, moderators, reflectors and coolant materials by varying the kinds, the geometries, the configurations and the utilization purposes.

Another part of the presentation is to contain the feasibility study on the accelerator-driven system (ADS) conducted for nuclear transmutation analyses with the combined use of the solid-moderated and solid-reflected core and the fixed-field alternating gradient (FFAG) accelerator, in the Institute for Integrated Radiation and Nuclear Science, Kyoto University. Through the experimental analyses by MCNP with major nuclear data libraries (JENDL-4.0. ENDF/B-VII.1, JENDL/HE-2007 and JENDL/D-99), static and kinetic parameters of reactor physics are interestingly revealed for nuclear transmutation of minor actinides (Np-237 and Am-241) and uncertainty quantification of a coolant material (lead and bismuth), with respect to ADS. Additionally, experimental education programs for domestic and overseas students conducted at the Kyoto University Critical Assembly are introduced in the presentation.

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