7th International Symposium on Material Testing Reactors, Otwock-Świerk, Poland, 20-23 October 2014

Long-Term Irradiation Technology using Capsule at HANARO

Kee Nam Choo, Man Soon Cho, Sung Woo Yang, Yoon Taek Shin, Seng Jae Park, and Sang Jun Park

Dept. of Research Reactor Utilization, Korea Atomic Energy Research Institute 989-111 Daedeok-daero, Yuseong-gu, Daejeon, Korea

> Tel: +82-42-868-2381, Fax: +82-42-863-6521 E-mail : knchoo@kaeri.re.kr

A new capsule technology for long-term irradiation was prepared and tested at HANARO for a neutron irradiation of the core materials of research reactors as a part of the research reactor development project. Irradiation testing of the materials including graphite, beryllium, and zircaloy-4, which are supposed to be used as the core materials in research reactors, was required for irradiation of up to 8 reactor operation cycles. As HANARO instrumented capsules have been irradiated within 4 cycles, a new capsule and a capsule system was also improved for long-term irradiation of the materials. The capsule was first designed and fabricated to irradiate materials for a long-term of 8 irradiation cycles at HANARO. Therefore, the safety of the new designed capsule was fully checked before irradiation testing, and the capsule was successfully irradiated at up to 8 cycles at HANARO. Based on the results of the irradiation, some improvements in the capsule and system were suggested for a longer irradiation test at HANARO.