Study on a Low-activation Method for Concrete with the Use of B_4C-loaded Epoxy Resin Board

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Recently, neutrons have been studied for application in various fields such as structural analysis of crystals, non-destructive analysis of cultural properties, and boron neutron capture therapy. However, activation of concrete in accelerator facilities has caused the problem whereby radiation workers are exposed to radiation and the disposal cost of radioactive waste will increase at the time of abolition of these facilities. In order to resolve these problems, in this study, a neutron-shielding structure with the use of B_4C-loaded epoxy resin board was devised, and the shielding performance of the board and the low activation effect on the concrete of the structure were verified by simulated calculation and neutron irradiation testing. The results showed the usability of the structure with the use of the board for low activation of concrete.