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Investigation of C-14 in the CRUD collected on the coolant filter for safety disposal of radioactive waste containing C-14 (II) –Chemical alternation of ion exchange resin under simulated condition in primary coolant of PWR –

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Radiocarbon (C-14) is recognized as a radionuclide that includes significant impact on public exposure in safety assessment of radioactive waste disposal. Its origin, generation mechanism and chemical forms in the wastes are required to be understood for the reasonable and proper safety assessment of the radioactive waste disposal. Some previous studies have reported occurrence of insoluble C-14 in PWR, and suggested that ion-exchange resin could be its origin. However, this hypothesis has not been well evidenced yet, because information about the generation mechanism and chemical form of the insoluble C-14 is still limited.

In this study, alternation of the resin under heating and/or irradiation was investigated to understand the alternation of the resin in PWR. In addition, characteristics of CRUD on a coolant filter for the actual PWR were compared to those of the heated/irradiated resin. The results suggested that the insoluble C-14 arises from alternation of the ion-exchange resin.

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