

Research Report

Cs Adsorption Capability of Activated Charcoal and its Incineration Volume Reduction Ratio and Cs Recovery Ratio

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● **Summary** ● A large amount of radioactive substances were released into the environment due to the accident at Fukushima Daiichi Nuclear Power Plant, and there is a need for Cs removal technology from the environment. The purpose of this study is to evaluate the Cs adsorption capability of cedar and beech (*Cryptomeria japonica*, *Fagus crenata* Blume) charcoal modified with boiling nitric acid and to confirm the volume reduction ratio and Cs recovery ratio during incineration, and Cs elution ratio from the ash. The Cs adsorption capability of cedar and beech charcoal were improved by the nitric acid activation treatment. About activation time, the maximum Cs adsorption was obtained by 9 hours and 12 hours for cedar charcoal and beech charcoal, respectively. The Cs adsorption capability of the modified cedar and beech charcoal were increased about 3 times (31 mg-Cs/g) and 7 times (32 mg-Cs/g), respectively than that of the raw charcoal. In the volume reduction of Cs adsorbed charcoal at 500-800°C using an electric muffle furnace, the reduction ratio was as high as about 98% for both cedar and beech charcoal. The recovery ratio of Cs was as high as 95% or more at 500°C, but decreased as the temperature increased. Similarly, the Cs elution ratio showed a high value of 90% or more at 500°C, and decreased as the temperature increased.

Key Words: Cs removal, wood charcoal, thermal nitric acid treatment, volume reduction ratio, Cs recovery ratio, Cs elution ratio

Received March 13, 2020; Accepted November 30, 2020; Recommended by chairpersons in the 8th annual meeting of SRRCE

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