

Report

Development of the Radioactive Cesium Recovery System for Effective Safekeeping at the Final Disposal Site. "Adsorption Separation - Combustion Oxidation - Concentration"

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Summary

Most of radioactive cesium is concentrated to fly ash by burning radioactive waste. Washing this fly ash with water promotes elution of radioactive cesium into the water. Adsorbent materials are used for the removal of radioactive cesium which dissolves in water. The radioactive cesium in the water is removed by adsorbent materials which should be kept in final disposal sites for radioactive waste. Adsorbent materials should be selected considering volume reduction, stability and safety of radioactive waste. This study focused on prussian blue nanoparticles as an adsorbent material to remove radioactive cesium. A solid-liquid separator (filtering) separates adsorbent material and treated water. The used adsorbent material is dewatered by centrifugation. The dewatered adsorbent material is filled up into a container. The dewatered adsorbent material is dried and oxidized into residue including radioactive cesium compounds and iron oxide by electromagnetic induction heater. The residue can be kept safely in a sealed container because the radioactive cesium compounds in the residue are inorganic compounds. In addition, the radioactive cesium compounds can be extracted from the residue by washing with water, which can reduce the volume of radioactive waste. Our method is effective on safe storage for radioactive cesium at final disposal sites for radioactive waste.

Key Words: Final disposal site, Cesium, Prussian blue nanoparticles
