

## Pyrolysis and oxidative pyrolysis characteristics of waste cation exchange resins doped with radioactive metal surrogates

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Ion exchange resins are used in water treatment system of nuclear power plant. The amount of the waste ion exchange resins is increasing. Therefore, the effective method to reduce volume of the resins and to stabilize metals captured by the resins is required. The purpose of this study is to evaluate thermal decomposition characteristics of the resins under pyrolysis and oxidative pyrolysis conditions using the TGA (thermogravimetric analyzer). In this study, cation exchange resins doped with radioactive metal surrogates were used as sample resins. The resins were heated to 900 °C in the TGA with a ramping rate of 3 °C/min under N<sub>2</sub> and O<sub>2</sub> atmospheres. About 23% and 0% of pure resins remained under oxygen free atmosphere (N<sub>2</sub>>99.99%) and oxidizing atmosphere (O<sub>2</sub>>99.99%) respectively. Morphology of residues was observed by scanning electron microscope (SEM). Metals in the residues were speciated using X-ray diffractometer (XRD). Cobalt existed as CoO and Co<sub>3</sub>O<sub>4</sub>, and strontium existed as a SrSO<sub>4</sub>.