

## Production of Clean Fuel from Plastics Contained in E-waste by Removing Bromine

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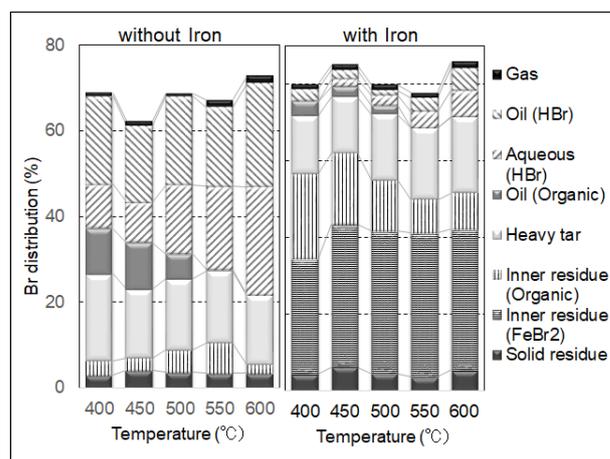
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Thermal decomposition of epoxy board (50.0 g) containing the brominated flame retardant was carried out with/without iron powder (50.0 g). Reactor was divided up and down by a porous ceramic disk, and each reactor could be temperature-controlled separately.

The liquid product was separated into oil and water, oil was mainly composed of phenol and cresol derivatives, and the water contained phenol. Without iron powder, yield of oil was 50 wt% at 500 °C and was maximum. In the presence of iron powder, oil yield was 48% maximum at 450 °C, and the heavy tar and the water products decreased, and yield of the inner residue increased.

Bromine was distributed in all of products, and main bromine compounds were contained in water and oil as hydrogen bromide without iron powder. Main organic bromine compounds in oil were bromophenol and dibromophenol, these decreased with temperature increasing and were hardly observed at 600 °C. In the presence of iron powder, bromine was recovered mainly as iron bromide (FeBr<sub>2</sub>) in inner residue. These experimental results indicate that iron powder can be used as sorbent and catalyst to decrease bromine concentration of the liquid products.

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Distribution of bromine compounds derived from epoxy board

### Author Biography:

Our research group have been studying removing halogen compounds from PVC or printed circuit board, recovering useful resources by solubilization of plastics using organic solvents, and standardization of recovered carbon fiber derived from CFRP. We like to make many people to understand the importance of plastic recycling.

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Research Interest: Plastic recycle, Recovery of carbon fiber from CFRP

