

Development of continuous metal recycle system from waste printed circuit board (wPCB)

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Waste PCB is made by various metal, so researches focus on the recycle valuable metals from it. For this process, usually chemical treatment is already verified, but still it makes additional pollution from its toxicity. Therefore, electrochemical approach can be an alternative process, but low mass transfer rate and limitation of electrode's life time is remained subjects.

Therefore, this study suggest a new electrochemical method, which is a continuous system using the mechanism of redox flow battery (RFB) and membrane capacitive deionization (MCDI). When redox active material reduced in MCDI module, metal cation should be transferred to RFB electrolyte to maintain the charge balance of system. Captured metal ions are flowed with electrolyte to RFB module where RAM return to origin state with oxidize. Consequently, flowed metal ion transferred to plating electrolyte based on the same mechanism of MCDI module and ions satisfy enough reduction potential would be reduced to metal foam. During this process, anions are also transferred to opposite electrolyte in MCDI module and captured in ionic liquid, Al based deep eutectic solvent.