

Thermoresponsive Crown Ether Polymer Brushes Grafted on Carbon Nanotube as Adsorbent for Selective Palladium Recovery from Spent Automobile Catalyst Converter

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N-Isopropylacrylamide co-polymerized with dithia-crown ether (CE) were grafted as brushes on carbon nanotube (CNT) to afford an adsorbent for Pd²⁺. Adsorption results reveal its selectivity towards Pd²⁺ when tested in simulated catalytic converter leachate solution. Recyclability of the adsorbent is demonstrated by temperature-controlled adsorption-desorption cycles for the repeated capture and release of Pd²⁺. Overall results demonstrate the reusability and effectiveness of the developed adsorbent for the recovery of Pd²⁺ from highly acidic sources. This study was supported by NRF funded by The Ministry of Science and ICT (2017R1A2B2002109 and 2020R1A2C1003560), Ministry of Education (2020R1A6A1A03038817), and by KETEP funded by the Ministry of Trade, Industry & Energy (MOTIE No. 20194010201750).