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## **Controlled Pyrolysis of epoxy thermoset waste into activated carbon for the remediation of nano-plastic contaminated wastewater**

Plastic nanoparticle (NP) contamination of water has emerged as a pressing issue due to the increasing accumulation of plastic waste in the environment. The use of activated carbon (AC) for the adsorption of NPs is not well studied but would provide an inexpensive alternative to advanced wastewater treatment techniques. In this study, AC was produced from non-recyclable thermoset epoxy and tested for the adsorption of NPs. An optimal product exhibiting a high surface area (1705 m<sup>2</sup>/g) and yield (32%) was produced through KOH activation and was found to adsorb NPs through multilayer filling described by the BET model ( $R^2 = 0.96$ ). The AC achieved 97% recovery of simulated NP wastewater at an AC loading of 2.5 g/L, surpassing the performance of commercial AC under similar circumstances. Therefore, the epoxy-based AC can potentially solve the issue of NP pollution in wastewater effluents while simultaneously valorizing a non-recyclable plastic waste stream.