

## Preparation and Electrochemical Properties of Porous Carbon Materials Derived from Waste Plastic Foam and Their Application for Supercapacitors

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In order to achieve resource recycling and environmental protection, the waste plastic foam-based porous carbon material PMC-T is prepared by a high-temperature pyrolysis activation method. Plastic foam-based porous carbon PMC-T is an amorphous carbon with a honeycomb-like structure, a specific surface area of up to  $2281 \text{ m}^2 \text{ g}^{-1}$ , and a reasonable pore size distribution. Cyclic voltammetry tests and galvanostatic charge/discharge tests show that the plastic foam-based porous carbon material PMC-700 exhibits excellent electrochemical performance. Specifically, in a 6 M KOH electrolyte at a  $1 \text{ A g}^{-1}$  current density, the specific capacitance reached  $296 \text{ F g}^{-1}$ . Additionally, PMC-T demonstrates good cycle stability, and after 5000 charging and discharging cycles, its capacitance retention rate is as high as 87.1%. The plastic foam-based porous carbon exhibits excellent electrochemical properties.

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**Keywords:** Waste plastic foam; Porous carbon material; Supercapacitor; Specific surface area; Electrochemical performance

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