

Synthesis of Mesoporous Carbon derived from Polymerization-Induced Microphase Separation of Block Copolymers

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Mesoporous carbon has been widely used in various applications such as batteries, fuel cells, electrocatalysts and biosensors. Amphiphilic block copolymer is generally used as a structure directing agent for porous structure to give large mesopores. Here, we suggest introducing of polymer both as a carbon source and a structure directing agent. Microphase-separated polymer nanostructure was first obtained by atom transfer radical polymerization (ATRP). Styrene and divinylbenzene were randomly polymerized under existence of PEO-Br macroinitiator. Divinylbenzene can prevent coarsening of styrene block, resulting in microphase separation of PEO block and S/DVB block. To produce mesoporous carbon, S/DVB block was hypercrosslinked using Friedel-Crafts alkylation. After further heat treatment at 700 °C, mesoporous carbon was obtained.