

Synthesis and Property Study of Mesoporous Carbon and Silica-Carbon Thin Films

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Recent years, mesoporous carbon materials have attracted many researchers because of their combined high ordered mesostructures and unique porosities with the properties of carbon materials. Mesoporous thin films are one kind of important devices as mesoporous materials are developed for many applications. Some works have been reported to make mesoporous carbon thin films based on organic-organic self-assembly between surfactants and precursors^[1~3]. However, the distortion even collapse of mesostructures and the drop of film qualities during carbonization at high temperature is a big problem. Here we develop a series of mesoporous carbon thin films with diversity of mesostructures, and some silica composites have been incorporated into the framework to improve the stabilities of films, which is based on the synthesis of C-FDUs mesoporous carbon and silica-carbon materials reported by our group recently^[4~5]. Cubic and hexagonal mesostructured carbon thin films were obtained with uniform pores around 3.4 nm (Figure 1., details in poster). The effect of silica in composite films on the stability has also been studied. These mesoporous carbon and silica-carbon thin films would show many applying potentials such as low k materials.

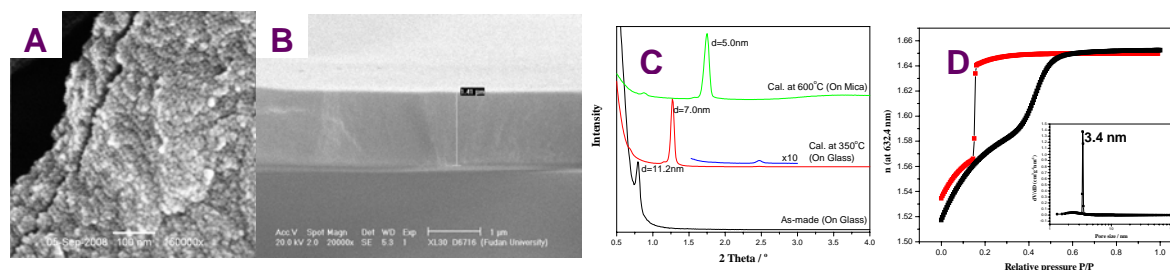


Figure 1. FESEM (A) , SEM (B) images, XRD pattern (C) and isotherm (D) (with PSD insert) of cubic mesoporous carbon thin film.

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