



Sulfur-encapsulation in carbon in nanocarbons

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キーワード : X-ray diffraction, crytallinity, Amorphous disorder

1. 背景と研究目的

Sulfur has been widely used as cathode material for lithium-sulfur batteries. It is necessary to understand the structural difference of the sulfur confined in different pores and its bulk state. X-ray diffraction (XRD) analysis is a facile and useful method to determine the crystallinity of solid materials. We encapsulated sulfur in porous carbon with different pore width and measured the X-ray diffraction of these materials.

2. 実験内容

Sulfur was encapsulated in a series of porous carbon with different pore width. The external sulfur was evaporated by heat-treatment. The XRD patterns of sulfur-contained porous carbon were obtained in Aichi SR.

3. 結果および考察

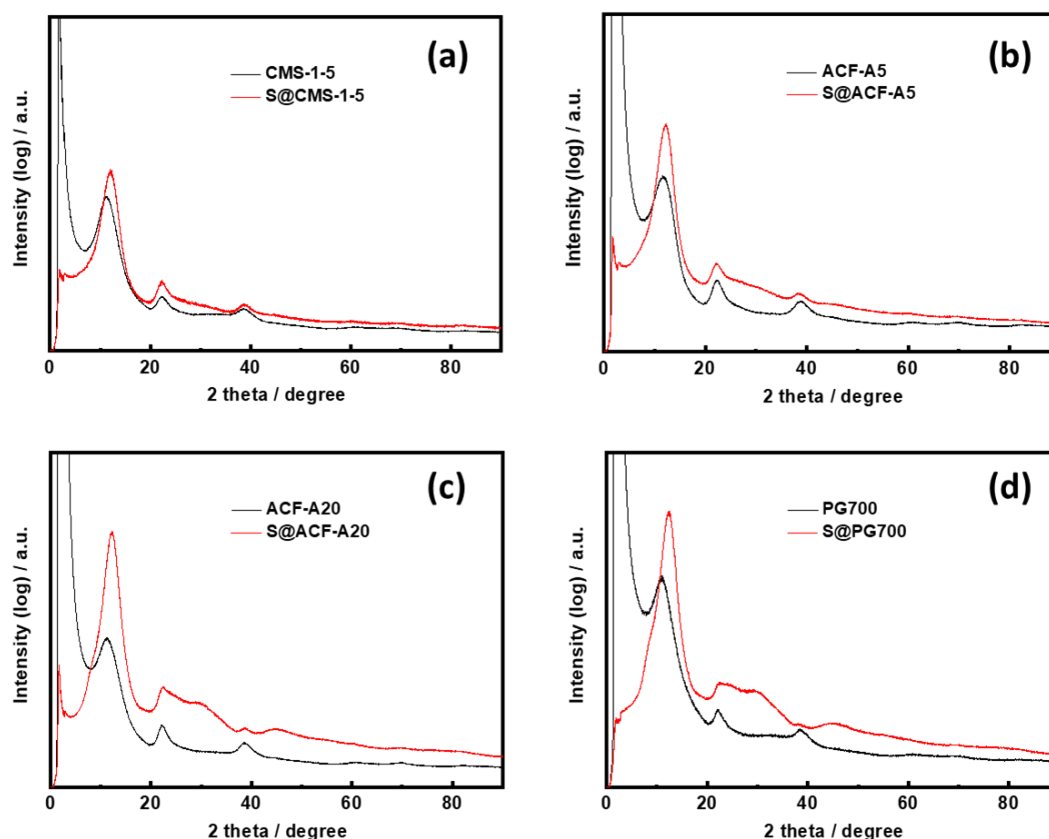


Fig. 1 XRD patterns of sulfur encapsulated in different porous carbons.

Figure 1 shows the XRD patterns of different porous carbon with (red) and without (black) sulfur encapsulation. Sulfur-free porous carbons have broad 002, 01 and 004 peaks, indicating their non-crystalline structure. Sulfur encapsulation doesn't give any extra peaks on XRD pattern, suggesting the confined sulfur is in amorphous state. However, the XRD patterns show significant hump between 20 to 40 degree after the sulfur encapsulation. Electron radial distribution functions will be determined from the XRD patterns in future.