Electronic Supplementary Material (ESI) for Journal of Materials Chemistry

High performance ordered mesoporous carbon/carbon nanotube composite electrodes for capacitive deionization

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Supporting Information

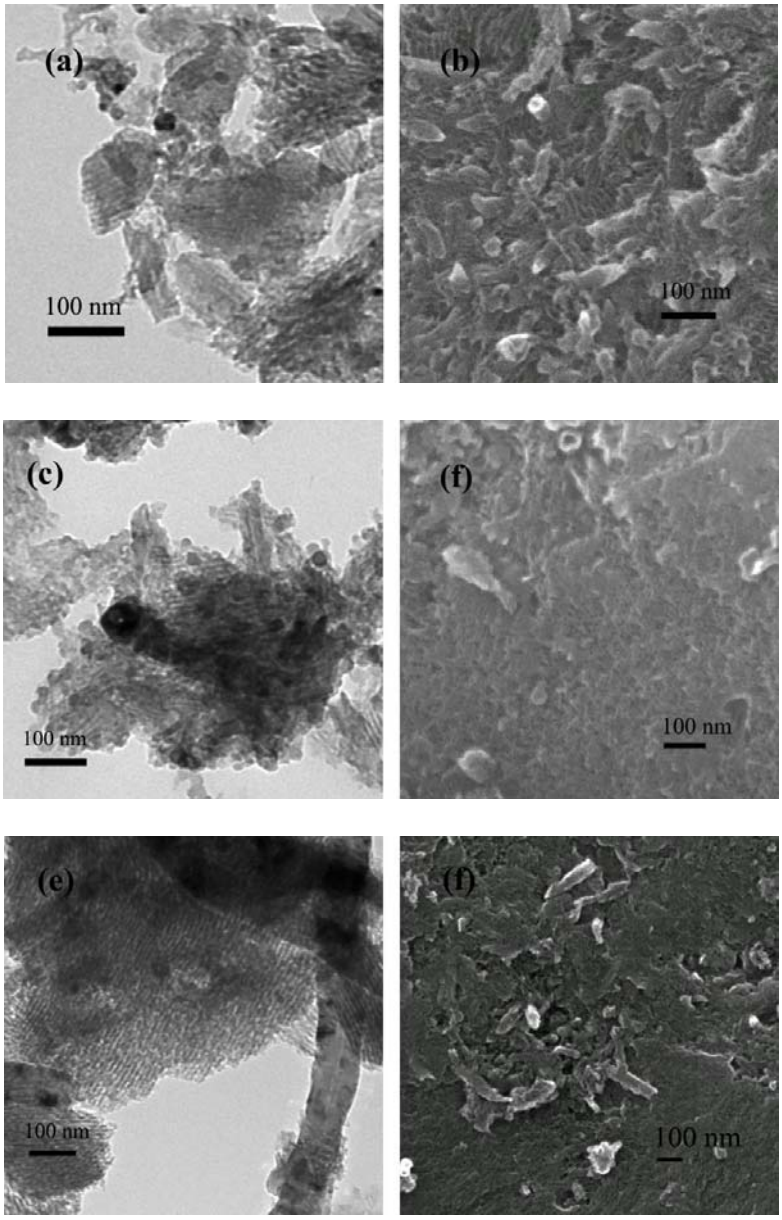

Fig. S1 TEM and SEM images of the OMC/CNT composites with various CNT contents: (a-b) 5%, (c-d) 15%, and (e-f) 20%.

The well-ordered composite structures of OMC/CNT composites were confirmed by TEM

and SEM images shown in Fig. S1. It can be clearly observed that the entire OMC/CNT materials were detected to have both mesopores and nanotubes, which can provide a proof of the synergistic effect in these materials. The existence of CNTs in composites provides a conductive network among the high ordered mesoprous structures so as to improve the electrical conductivity. Noteworthy, the increasing content of CNTs does not affect the growth of the range ordered hexagonal structure [1]. It can be found that the well-arranged mesoporous structures were still obtained even when the content of the CNTs was 20% in Fig. S1e-f.

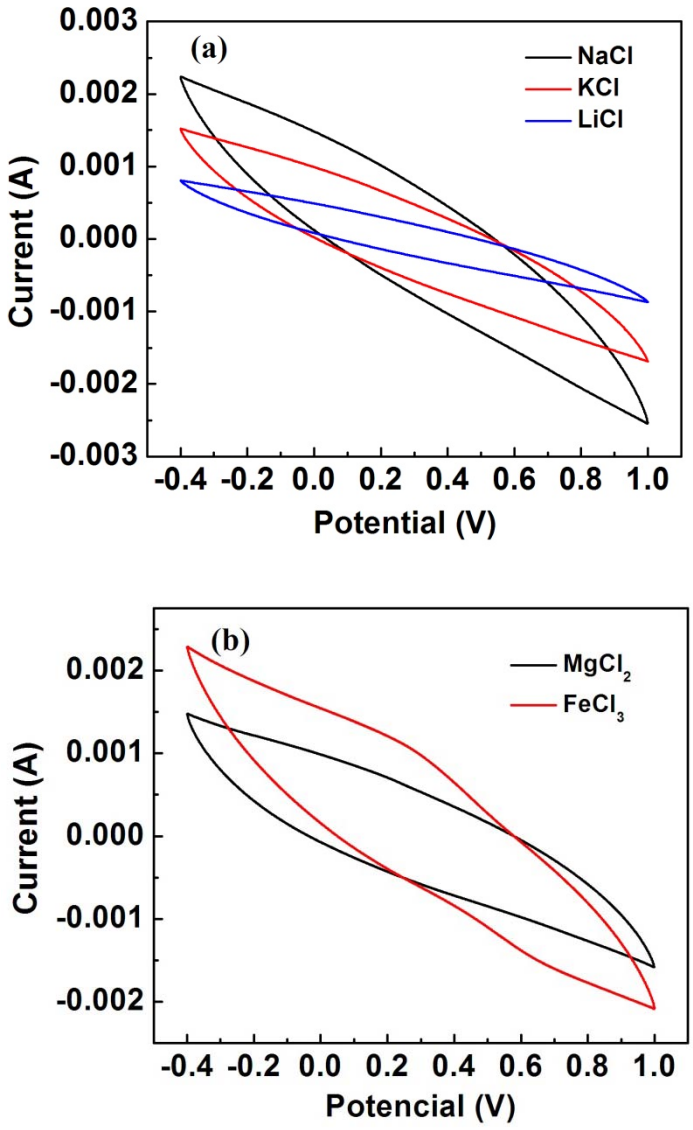

Fig. S2 CV curves of the composite electrodes in NaCl, KCl, LiCl, $MgCl_2$, and $FeCl_3$ solutions at a scan rate of 10mv/s.

Fig. S2 shows the CV curves of the OMC/CNT composite electrodes in NaCl, KCl, LiCl, $MgCl_2$, and $FeCl_3$ solutions with the same concentration of 0.5 g/L at a scan rate of 10 mv/s. as cab be seen from Fig.S2, the overall CV plots indicate the existence of electrical double layer behaviors in various aqueous solutions. The deviation from the regular shape of CV plots is mainly attributed to the inherent resistance of the mesoporous structures and the heteroatoms including oxygen remained in the porous structures[2].

Reference

[1] Y. Meng, D. Gu, F.Q. Zhang, Y.F. Shi, L. Cheng, D. Feng, Z.X. Wu, Z.X. Chen, Y. Wan, A. Stein, D.Y. Zhao, Chem Mater, 18 (2006) 4447-4464.

[2] K.X. Wang, Y.G. Wang, Y.R. Wang, E. Hosono, H.S. Zhou, J Phys Chem C, 113 (2009) 1093-1097.