

# Hierarchically structured porous carbon fibers for EDLC

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Hierarchical porous carbon materials have been actively studied by many researchers because of their excellent adsorption properties [1-3]. Here, we report the structural and electrochemical properties of the hierarchically structured porous carbon fibers which were prepared by adopting a thermal decomposition of cotton fibers impregnated with  $Zn^{2+}$  and  $NO_3^-$  [4]. The hollow porous carbon fibers were consisted of sheet-like structures which formed by thermal decomposition of  $NO_3^-$  impregnated in the cotton fibers. Furthermore, the introduction of two activating agents ( $Zn^{2+}$  and  $NO_3^-$ ) generated a nanoporosity. The  $N_2$  adsorption isotherms at 77 K indicated that the hollow carbon fibers have a high specific surface area ( $1391\text{ m}^2/\text{g}$ ) and a trimodal porosity consisting of micro-, meso-, and macro-pores. Therefore, the hollow carbon fibers would offer advantages for an electrode as electric double layer capacitor (EDLC). The electrochemical results indicated that the resulting hollow carbon fibers demonstrated excellent capacitance retention at high current density, indicating fast ion diffusion into their advanced structures (hollow core, sheet-like structures, and trimodal pore structures).

## References

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