

## Enhanced Oxygen Reduction Reaction by N-Doped Mesoporous Carbon Nanospheres

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**Abstract :** The development of ordered mesoporous carbon materials with controllable structures and improved physicochemical properties by doping heteroatoms such as nitrogen into the carbon framework has attracted a lot of attention, especially in relation to energy storage and conversion. Herein, a series of Nitrogen-doped mesoporous carbon spheres (NMC) was synthesized via a facile dual soft-templating procedure by tuning the nitrogen content and carbonization temperature. Various physical and (electro) chemical properties of the NMCs have been comprehensively investigated to pave the way for feasible design of nitrogen-containing porous carbon materials. The optimized sample showed a favorable electrocatalytic activity as evidenced by high kinetic current and positive onset potential for oxygen reduction reaction (ORR) due to its large surface area, high pore volume, good conductivity and high nitrogen content, which make it as a highly efficient ORR metal-free catalyst in alkaline solutions.

**Keywords :** porous carbon, N-doping, oxygen reduction reaction, soft-template

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