

### Synthesis and electrochemical performance of heteroatom-doped ordered mesoporous carbon materials

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Fuel cells are widely known to play a key role in the next generation of environmental friendly energy device. Fuel cell reactions invariably involve oxygen reduction reaction at the cathode. So it is important to develop suitable electrodes which can promote ORR activity. Pt catalyst has been attracting much attention due to high efficiency for oxygen reduction reaction in fuel cell, especially direct methanol fuel cell. However, there are problems such as self-aggregation in using Pt-catalyst and collapse of porous support material structure concomitant with non-activating catalysis. Furthermore, it is very expensive because about 90 percent of the world's platinum supply comes from only two countries-South Africa and Russia. There are two methods to solve these problems. One method is to control the porous carbon framework. Another method is to dope porous carbon materials with heteroatoms like N, S, O and P. Our research is set up to synthesize heteroatom-doped porous carbon materials. Also we confirmed their electrochemical performance.