Synthesis of heteroatom-doped porous carbon materials

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Pt catalyst has been attracting much attention as a high efficiency for oxygen reduction reaction in fuel cell, especially direct methanol fuel cell (DMFC). But, there are problems in using Pt-catalyst. For instance, self-aggregation, and catalytic non-activating according collapse of porous support material structure. Furthermore, it is very expansive because about 90 percent of the world's platinum supply comes from just two countries--South Africa and Russia. One method that controls the porous carbon framework can be proposed as a strategy to solve these problems. Another approach to find solutions is to dope porous carbon materials with heteroatom (N, S, O, P).