

Effect of particle size of N-doped mesoporous carbon catalyst for oxygen reduction for PEMFC

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We investigated effect of particle size distribution of N-doped mesoporous carbon catalyst for PEMFC cathode side. N-doped mesoporous carbon synthesized by polyacrylonitrile as carbon and nitrogen precursor, and three kind of silica that is different by particle size each other and average particle sizes was 20, 45, 75  $\mu\text{m}$  as hard templates. Carbons were produced by pyrolysis which is thermochemical decomposition under nitrogen and 900  $^{\circ}\text{C}$ . We impregnated iron (1.5 %) on the carbon for prepare the nonprecious metal catalyst for oxygen reduction. Carbons were characterized scanning electron microscopy (SEM), transmission electron microscopy (TEM) and BET. Oxygen reduction reaction test was performed 0.5 M  $\text{H}_2\text{SO}_4$  solution in room temperature. A  $\text{H}_2/\text{O}_2$  proton exchange membrane fuel cell (PEMFC) constructed with the catalyst exhibits a current density as high as 0.21  $\text{A}/\text{cm}^2$  at 0.5 V using a cathode loading of 4.95  $\text{mg}/\text{cm}^2$ .