N-doped Carbon Nanotubes Prepared at Different Temperatures for Oxygen Reduction Reaction

Hengyi Li[a], Xuan Cheng[a,b]

[a] Department of Materials Science and Engineering
[b] Fujian Key Laboratory of Advance Materials
Xiamen University, Xiamen 361005, China

F.-B. Weng, A. Su

Fuel Cell Center
Yuanze University
Tao-Yuan 32003, Taiwan

The nitrogen-doped carbon nanotubes (N-CNTs) were synthesized by chemical vapor deposition using the four reacting temperatures of 800°C, 850°C, 900°C and 950°C. The best ORR activity was obtained with the N-CNTs prepared at 800°C due to the most of N being doped into CNTs mainly in the form of pyridinic type. The doped N aggregated within the bamboo joints and strongly affected the growth of CNTs. The poor ORR activity obtained with the N-CNTs prepared at 900°C could be related to the fact that this reaction temperature is so close to the crystal transformation temperature of iron that N would be difficult to be doped into nanotubes.

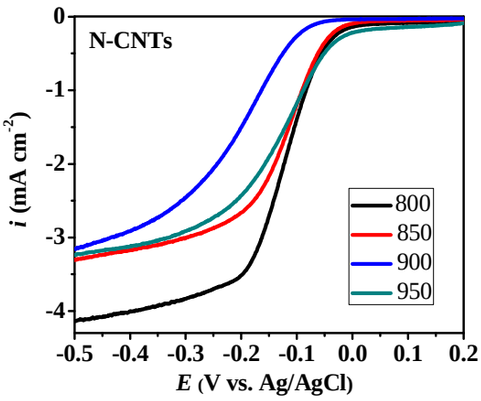

Figure 1. Typical RDE polarization curves obtained with N-CNTs prepared at different temperatures in 0.1 mol L^{-1} O_2 saturated NaOH solutions at 1600 rpm.