

A Study on the Capacitance Dispersion of  
the Fractal Carbon Electrode  
프랙탈 탄소전극에서의 커패시턴스 분산에 대한 연구

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Capacitance dispersion of the fractal carbon electrode was investigated using atomic force microscopy (AFM), X-ray photoelectron spectroscopy (XPS), and ac-impedance spectroscopy. For this purpose, four types of as-received pyrolytic graphite electrode, as-received, mechanically polished, and as-activated glassy carbon electrodes were prepared with different fractal dimensions and amounts of edge orientation. The fractal dimensions of the carbon electrodes were determined from the image analysis of AFM images based upon triangulation method. The amounts of edge orientation on the surface of the carbon electrodes were qualitatively estimated from the XPS analysis of surface acidic functional groups that were preferably formed on the edge plane by the heat treatment of the carbon electrodes. From the experimental results, it is concluded that the extent of capacitance dispersion, namely the deviation from the ideal capacitive behaviour increases with increasing amount of edge orientation of the carbon electrodes, regardless of the fractal dimension of the carbon electrodes.

#### References

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