

## BFA2

### A Study on the Electrochemical Reduction of $\text{SOCl}_2$ on the Porous Carbon Cathode in $\text{Li}/\text{SOCl}_2$ Batteries

#### $\text{Li}/\text{SOCl}_2$ 배터리를 다공성 탄소 캐소드에서의 $\text{SOCl}_2$ 의 전기화학적 환원에 관한 연구

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The electrochemical reduction of  $\text{SOCl}_2$  on the porous carbon cathode in  $\text{Li}/\text{SOCl}_2$  batteries was investigated using nitrogen gas adsorption, galvanostatic discharge experiment, ac-impedance spectroscopy, and potentiostatic current transient technique. For this purpose, the carbon electrode specimens were first galvanostatically discharged at current densities of 10 - 50  $\text{mA cm}^{-2}$  in 1.25 M  $\text{LiAlCl}_4\text{-SOCl}_2$ . Then they were exposed either to the ac-impedance measurement or to the potentiostatic current transient experiment. The pore size distributions of discharged porous carbon electrode specimens were determined with help of nitrogen gas adsorption at 77 K. The resistive and capacitive elements were roughly estimated by using complex non-linear least square (CNLS) fitting of the ac-impedance spectra to a six-RC-element ladder network. The cathodic current transients were simulated from the circuit analysis using SPICE based upon the ladder network at a potential step. The simulated current transients accorded well in shape and values with those experimentally measured. The mechanism of electrochemical reduction of  $\text{SOCl}_2$  on the porous carbon cathode was discussed in terms of the porous structure change of carbon electrode specimens.

#### References

1. C.-H. Kim, S.-I. Pyun and H.-C. Shin, accepted for publication in J. Electrochem. Soc. (2001).
2. S.-B. Lee, S.-I. Pyun and E.-J. Lee, accepted for publication in Electrochim. Acta (2001).