

MICRO-RAMAN STUDY OF ELECTRODE SURFACE IN Li/SOCl₂ CELLS (EXTENDED ABSTRACT)

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Micro-Raman spectroscopy is a technique particularly well suited to the study of chemical species formed at the electrolyte/electrode interface. This non-destructive method allows an *in situ* study of the reactions during discharge.

We have constructed a microcell capable of being applied directly to the stage of the spectrometer in order to observe the reactions occurring in the solution near the electrodes, as well as on the surfaces of the electrodes. A description of this cell has been reported previously [1]. The electrolyte was 1.8 M LiAlCl₄ in thionyl chloride.

Raman spectra were recorded with a Dilor Microdil 28 spectrograph equipped with a multi-channel detector (intensified Reticon linear photodiode array), cooled to -20 °C, which allows a 500 cm⁻¹ band to be recorded directly. We have noted the events taking place on the surfaces of the electrodes: in particular, a very broad band is seen at about 1090 cm⁻¹ when the laser is focused on the lithium electrode surface.

This frequency suggests that a complex is generated at the lithium electrode surface which was thought to be a charge transfer complex between the LiCl passivation layer ion and one of the species present in the electrolyte. Wassif [2] has shown from optical absorption studies that charge transfer complexes may be formed between chloride ion and SO₂ or SOCl₂.

Raman and IR experiments were conducted in order to identify the complex. It appears that the species is a charge transfer complex between SO₂ and chloride ion. No SOCl₂·Cl⁻ complex was formed under our experimental conditions. Observations have been conducted at the carbon electrode surface. Preliminary results do not allow any conclusions to be reached on whether SO₂ is, or is not, adsorbed on the carbon electrode.

References

- 1 M. C. Dhamelincourt, F. Wallart and J. P. Lelieur, *J. Power Sources*, 20 (1987) 69 - 73.
- 2 A. Salamo, S. B. Salamo, M. Sobeir and S. Wassif, *J. Chem. Soc. A*, (1971) 1112 - 1117.

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