

# Measurement of Electrolyte Transport Parameters in a Lithium Ion Battery

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## ABSTRACT

Electrolyte transport parameters, including ionic conductivity, salt diffusion coefficient and the transference number of lithium ions, were measured based on the interpretation of the AC impedance response in the low frequency region for a simple electrochemical cell. The potential difference of a concentration cell was also measured to find a complete set of transport parameters as well as a thermodynamic parameter, the mean activity coefficient, with concentration dependence of the electrolyte of interest. Comparison of the method used in this study with available methods in the literature was made to justify this work. The solid electrolyte interface (SEI) formed on the surface of the lithium metal electrode was considered by a general model. The contribution of solid phase diffusion besides that of migration to the impedance response was also incorporated in our analysis. The influence of the solid phase diffusion in the SEI layer on the validity of estimating transport parameters was evaluated.

## REFERENCES

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