

Abstract

Cuprous sulphate has been shown to be a good solid electrolyte with a conductivity of $5.6 \times 10^{-4} \text{ ohm}^{-1} \text{ cm}^{-1}$ at 25°C . It is predominantly a Cu^+ ion conductor with negligible electronic conductivity.

A synthetic clay material based on Al and Mg has been prepared and this shows a high ionic conductivity at elevated temperatures. The conductivity at 350°C is $0.10 \text{ ohm}^{-1} \text{ cm}^{-1}$, which is higher than that of well known sodium β -alumina. The activation energy for conduction is 0.91 eV .

The actual conducting phase is a form of sodium aluminate formed on the surface of clay particles.

Solid state electrochemical cells have been fabricated using the above solid electrolytes. Sodium persulphate and vanadium bronzes have been used as electrode materials. The performance of some of the cells investigated in this work has been found to be comparable or even better than that of some of the commercially available button cells intended for miniature electronic devices.