RINGKASAN

Mempelajari konsep dasar termodinamika dapat dilakukan melalui model elektrokimia. Menurut Smith dan Vincent, sel elektrokimia seng-perak oksida dapat digunakan untuk keperluan tersebut.

Penelitian bertujuan untuk membuktikan ketergantungan harga gaya gerak listrik terhadap temperatur dan menentukan harga-harga parameter termodinamik sel seng-perak oksida. Penelitian dilakukan dengan menerapkan metoda Smith dan Vincent. Perubahan gaya gerak listrik pada setiap temperatur diikuti memakai Multimeter Digital HC-81. Pengukuran dilakukan pada temperatur 10°C-70°C.

Hasil penelitian menunjukkan bahwa harga gaya gerak listrik sel cenderung turun apabila temperatur naik, sesuai dengan Persamaan Nerst. Sedangkan perubahan energi bebas Gibbs, entalpi dan entropi reaksi hasil perhitungan pada temperatur 25°C berturut-turut adalah -304,121 kJ mol^{-1}, -312,842 kJ mol^{-1} dan -29,264 J $°K^{-1}mol^{-1}$, dekat dengan harga-harga pada literatur.

Harga-harga parameter termodinamik dengan menggunakan model sel elektrokimia sesuai dengan yang diperoleh melalui pengukuran panas oleh Hills menurut laporan Smith dan Vincent.

SUMMARY

The basic concepts of thermodynamic studies can be done via electrochemical models. According to Smith and Vincent, the electrochemical system as zink-silver oxide cell can be served for that purpose.

The objectives of this research are establishing dependence of electromotive force values to the temperature and determining the thermodynamic parameters of zink-silver oxide battery. The Smith and Vincent method was applied to the experiment. The electromotive force change at each temperature variation was followed by Digital Multimeter HC-81. The measurement was carried out at the temperature range of 10 - 70 ^{o}C.

The experiment results showed that the electromotive force values of battery cell tend to decrease as the temperature increased; thus are in agreement with Nernst equation. Furthermore, the Gibbs free energy, enthalpy and entropy changes that calculated at 25 ^{o}C, respectively are -304.121 kJ mol^{-1}, -312.842 kJ mol^{-1} and -29.264 J ^{o}K^{-1} mol^{-1}, are quite similar to those from the literature.

The values of thermodynamic parameters from the experiment based on electrochemical models are in agreement with the values from the heat measurement by Hill as reported by Smith and Vincent also.