

Studi material elektroda baterai lead acid selama pengosongan dan pengisian muatan = Study of lead acid battery electrode materials during discharge and charge

Tasmo, author

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Abstrak

Telah dilakukan pengujian pengosongan dan pengisian muatan selama enam jam terhadap material elektroda baterai lead acid. Selama pengosongan muatan dilakukan pengukuran terhadap pH larutan elektrolit, tegangan dan kuat arus listrik setiap setengah jam. X-Ray Diffractometer (XRD) digunakan untuk melihat struktur dan perubahan senyawa pada material elektroda positif dan elektroda negatif setiap dua jam pengujian pengosongan muatan. Program Match dan GSAS digunakan untuk menganalisis senyawa yang terbentuk selama pengujian pengosongan muatan.

Hasil menunjukkan bahwa material elektroda negatif yang terdiri dari timbal murni (Pb) dan elektroda positif yang terdiri dari timbal dioksida (PbO₂, plattnerite) telah dikonversi menjadi timbal sulfat (PbSO₄, anglesite). Semakin lama pengujian pengosongan muatan, timbal sulfat yang terbentuk semakin banyak, timbal murni dan timbal dioksida pada masing-masing elektroda semakin berkurang. Hasil pengukuran menunjukkan semakin lama pengujian pengosongan muatan, pH larutan elektrolit semakin meningkat, tegangan listrik dan kuat arus listrik semakin berkurang.

Experiment of discharging and charging has been done for six hours on the lead acid battery materials. During discharging, the voltage, currents and pH of the electrolytes has been measured every thirty minutes. X-Ray Diffractometer (XRD) is used to determine the structure and the compound change in the positive and negative electrode every two hours. Match and GSAS program is used to acquire information about the compound formed during discharging.

The results showed that the negative electrode materials of lead (Pb) and positive electrode materials of Lead dioxide (PbO₂, plattnerite) has been converted into Lead Sulphate (PbSO₄, anglesite). As the duration of the discharging increased, the lead sulphate formed was increased while the Lead and Lead dioxide from each electrodes decreased. The results also showed that longer duration of discharging, resulted in increasing of pH causing decreasing of the voltage and currents of the electrolytes.