State of Charge Analysis Methods for Zn-Br Flow Battery Control

김영권, 김현식, 곽은식, 김동휘, 정현진, 강태혁, 강경보*
호남석유화학
(kanggb@lottechem.com*)

The Zinc/bromine system is a leading contender among flow batteries and must be operated somewhat differently compared with systems that do not plate a metal on the electrodes during charge.
As with all electrochemical systems however, a number of side reactions can occur during operation that can cause loss of capacity over extended charge–discharge cycling. To ensure the batteries be reliable and capable of delivering power and energy when required, an accurate determination of available capacity, i.e., state of charge (SOC), is necessary. It will enable the controller to man-age the battery work on its optimal state and extend its life.
In this present study, the results of a viscosity and conductivity study of the state of charge (SOC) dependent composition of electrolyte in a zinc-flow battery over a total charge-discharge cycle are conducted. The viscosity and conductivity of each electrolyte shows clearly differences in changing SOC. The particular advantages of viscosity and conductivity measurements for this purpose are the possibility to allow monitoring of system and providing information quickly and with moderate effort, which is indispensable for the study of dynamic processes.