

Performance Stability of Novel Sodium-Zinc Chloride Battery

Xiaochuan Lu, Guosheng Li, Jin Y Kim, John Lemmon, and Vince Sprenkle

Pacific Northwest National Laboratory, Richland, WA 99352, USA

ABSTRACT

The sodium-metal halide (ZEBRA) batteries have been considered as one of the most attractive energy storage technologies for stationary and transportation applications. Recently, we reported a novel Na-ZnCl₂ battery, which exhibits significant advantage in material cost over the state-of-the-art ZEBRA batteries such as Na-NiCl₂. There are multiple steps along with liquid phase formation during charge/discharge in this novel chemistry. In this paper, the stability of this battery will be thoroughly investigated and the effects of Zn/NaCl ratio and battery operating conditions (e.g., cycling capacity window, cut-off voltage, etc.) towards cell performance will be presented.