Abstract

Molten $CaCl_2$ is a useful electrolyte for certain pyroprocessing techniques, and the solubility of oxide ions in this salt is a critical characteristic of many of these techniques. CaO is a byproduct of direct oxide reduction (DOR), so the concentration of oxide ions can be used to determine the extent of these reactions. Using cyclic voltammetry (CV) with tungsten electrodes, the CaO concentration in the salt up to approximately 5 wt% was correlated to both oxidation peak height and power density values. This correlation was demonstrated in both equilibrium and transient conditions. CV is a promising method for the in situ real-time monitoring of CaO concentrations in DOR processes.