

Electrochemical Characterization of H₂O/CO₂ High Temperature Co-electrolysis Using a Flat-tubular Solid Oxide Co-electrolysis Cell/Stack

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Since the H₂O/CO₂ high temperature co-electrolysis requires an high operating temperature and electric power, it can be combined with renewable energy having waste heat and surplus electric power. Therefore, Can be completely independent and can be regenerated by using the syngas produced by this method, thus realizing the power-to-gas energy storage technology. In this study, to analyze the electrochemical characteristics and to optimize the H₂O/CO₂ high temperature co-electrolysis reaction by using a flat-tubular SOC cell with high electrochemical performance. We have constructed an orbital evaluation system considering the conditions and used impedance to macroscopically detect I-V curves and electrochemical reactions. In order to understand the increasing the production of syngas thereafter, a flat-tubular 6-cell stack with high output and structural durability in thermal cycle was constructed and electrochemical performance evaluation and synthesis gas analysis were carried out.