

Syngas production of HT H<sub>2</sub>O-CO<sub>2</sub> coelectrolysis in SOEC tubular cell

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Steam-carbon dioxide electrochemical conversion in solid oxide electrolysis cells (SOECs) is one of the efficient ways to reduce CO<sub>2</sub> emission and to simultaneously store the renewable power. In this study, H<sub>2</sub>O-CO<sub>2</sub> coelectrolysis performance and syngas synthesis in solid oxide electrolysis tubular cells at different operating temperature (700–850 °C) is tested. The results indicated that the coelectrolysis performance for Ni-YSZ/YSZ/LSM-YSZ electrolysis cell increases significantly with operating temperature. In addition, syngas yield was analyzed with various operating conditions such as the reaction composition, total flow rate, current density, and so on. Also, the pressurized coelectrolysis module system which is configured on the tubular SOEC cells is being developed.