

Hydrogen sulfide tolerance of modified anode material using Fe for molten carbonate fuel cell

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In this study, new anode material adding Fe for MCFC was developed. Since Fe is common and cheap material and it has good catalytic activity, Fe is good candidate material for anode of MCFC. Various content (10-30 wt%) of Fe are added into Ni-Al alloy. Modified anodes from ternary system Ni-Al-Fe demonstrate good both creep resistance and single cell performance. The creep strain of Ni-Al-30wt% Fe obtains 5% and is higher compared to that of conventional anode (6-10%). The single cell performance is above 0.8V under loading 150mA/cm² during 1000h with low voltage drop 5mV/1000h. Lithium ferrite, in-situ product of ferrite and lithium carbonate reaction at anode of molten carbonate fuel cell, exhibits excellent hydrogen sulfide tolerance over 150 ppm in short-term poisoning condition. Generally, Fe can be used as effective cost and hydrogen sulfide poisoning resistance material for anode of molten carbonate fuel cell.