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Mass Transport Mechanism in Porous Fuel Cell Electrodes

Experiments have been performed on hydrogen-oxygen fuel cells (with aqueous KOH electrolyte) to investigate the mechanism of the mass transport of oxygen in porous cell cathodes. From previous work in this field, it was theoretically premised that mass transport of oxygen at the anode occurs by diffusion, and that the latter mechanism limits the cell's electrical current density. The results of the recent experiments, however, show that much higher current densities are obtained with cell anodes (oxygen side) having a 100 micron-thin active layer of porous nickel containing silver electrocatalyst. The observed increase in current density has been attributed to a convective mass transport mechanism, which is much faster than the diffusion mass transport mechanism. These results suggest an approach for

further efforts to develop fuel cells that will operate at increased current densities.

Note:

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