

[54] **ELECTROCHEMICAL CONVERSION OF CO₂ AND CH₄ TO C₂ HYDROCARBONS IN A SINGLE CELL**

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(List continued on next page.)

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[57] **ABSTRACT**

A solid electrolyte electrochemical cell and process for concurrent gas phase electrocatalytic oxidative dimerization of methane at one side of the solid electrolyte and reduction of carbon dioxide to gaseous hydrocarbon products at the opposite side of the solid electrolyte. The electrochemical cell may use a solid electrolyte of an oxygen vacancy conducting type or a proton transferring type capable of transferring any proton mediating ion.

27 Claims, 1 Drawing Sheet

