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(54) **OPTIMIZING REACTIONS IN FUEL CELLS AND ELECTROCHEMICAL REACTIONS**

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(51) **Int. Cl.**

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(58) **Field of Classification Search** **429/13, 429/20, 21, 40, 10; 204/157.15**

See application file for complete search history.

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(57) **ABSTRACT**

This invention relates to novel methods for affecting, controlling and/or directing various reactions and/or reaction pathways or systems by exposing one or more components in a fuel cell reaction system to at least one spectral energy pattern. In a first aspect of the invention, at least one spectral energy pattern can be applied to a fuel cell reaction system. In a second aspect of the invention, at least one spectral energy conditioning pattern can be applied to a conditioning reaction system. The spectral energy conditioning pattern can, for example, be applied at a separate location from the reaction vessel (e.g., in a conditioning reaction vessel) or can be applied in (or to) the reaction vessel, but prior to other reaction system participants being introduced into the reaction vessel.

8 Claims, 69 Drawing Sheets

