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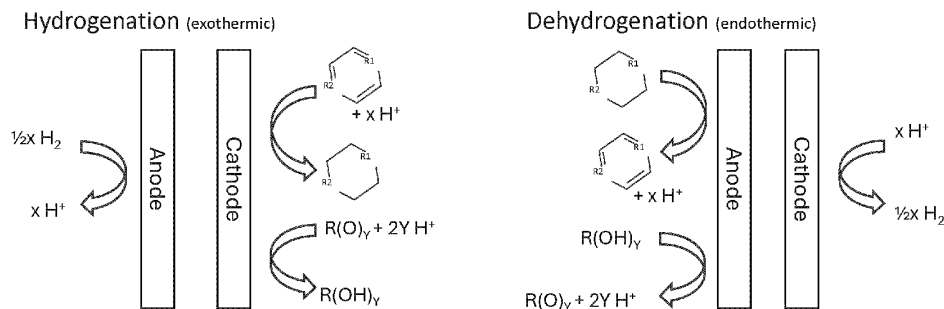


FIG. 1

(57) Abstract: The present disclosure provides hydrogen carrier fluid (HCF) compositions, comprising a lean- liquid organic hydrogen carrier (lean-LOHC) component comprising at least one cyclohexyl-based compound having at least one unsaturated bond, optionally in combination with one or more C₄₋₁₂ alkyl alcohol, or a rich-liquid organic hydrogen carrier (rich-LOHC) component comprising at least one cyclohexyl-based compound, optionally in combination with a C₄₋₇ ketone, a C₄₋₆ lactone or a mixture thereof; and an electrolyte component. Also provided is the use of these HCF compositions for storage and release of hydrogen, in an electrochemical reactor system.

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