

NitroCatalyst and Process for Nitrogen Reduction

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Technology Summary

A soluble electrochemical mediator including a polyaromatic hydrocarbon (arene) is reduced in the cell stack of a redox flow battery to form an anion radical. The anion radical is transferred to a reservoir containing a catalyst. Nitrogen is injected into the reservoir containing the anion radical and the catalyst. The nitrogen is reduced by the anion radical on the catalyst and the anion radical is oxidized back to the parent arene. The arene is recycled to the cell stack where it is reduced to the anion radical and transported back to the reservoir to reduce more nitrogen. The arene is biphenyl. The catalyst is carbon nitride or zeolite. When zeolite is used it is first ion exchanged to contain Li⁺ and Ca⁺² ions.

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