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Electrochemical reduction of nitrate at a poly crystalline SnCu modified platinum surface by using an H^+ conducting solid polymer in a sandwich type membrane reactor

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Graphical abstract

In a sandwich type membrane reactor, while Sn particles are incorporated with Cu-Pt catalyst, ammonia selectivity is decreased and nitrogen (N_2) selectivity is increased.



Abstract

The electrocatalytic reduction of nitrate ions (NO_3^-) was performed in a neutral medium by using a sandwich type membrane reactor, $M | \text{Nafion} | \text{Pt-X}$ (where, $X = \text{Cu}, \text{SnCu}$). The voltammetric and electrolysis results showed that the performances of catalytic surface were in the order of $\text{Pt} < \text{Cu-Pt} < \text{SnCu-Pt}$. A Cu-Pt catalyst generated ammonia, conversely, a

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