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Electrooxidation of hydrazine hydrate using NiaLa catalyst for anion exchange membrane fuel cells

Sakamoto, Tomokazu; Asazawa, Koichiro; Martinez, Ulises; Halevi, Barr; Suzuki, Toshiyuki; et al. **Journal of Power Sources** 234 (Jul 15, 2013): 252-259.

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AB

Abstract (summary) Translate

Carbon supported Ni, La, and Ni-xLa (0.1ANB<=ANBxANB<=ANB0.9) catalysts were synthesized by an impregnation/freeze-drying procedure followed by thermal annealing. The catalytic activity for electro-oxidation of hydrazine hydrate on anionic ionomer-coated catalysts was evaluated using a (4ANBXANB4) 16-channel electrochemical electrode array in 1.0ANBM KOHANB+ANB1.0ANBM hydrazine hydrate solution at 60ANB degree C. The Ni0.9La0.1/C catalyst oxidized hydrazine hydrate at a lower potential and exhibited higher mass activity in comparison with a similarly made Ni/C catalyst. Chemical insight suggests that the cause of improved performance for the Ni0.9La0.1/C catalyst is likely multifunctional synergism of the components. However, X-ray absorption fine structure (XAFS) and high voltage electron microscopy (HVEM) unexpectedly show some hcp-LaNi5 shells coating the fcc-Ni catalyst particles. As a result of the screening tests, an unsupported Ni0.9La0.1 catalyst was synthesized by spray pyrolysis and tested in a direct hydrazine hydrate fuel cell MEA (DHFC) producing 453ANBmWANBcm-2.

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Indexing (details) Cite

Subject	Carbon; Fuel cells; Nickel; High voltages; Hydrates; Catalysts; Arrays; Hydrazines
Title	Electrooxidation of hydrazine hydrate using NiaLa catalyst for anion exchange membrane fuel cells
Author	Sakamoto, Tomokazu; Asazawa, Koichiro; Martinez, Ulises; Halevi, Barr; Suzuki, Toshiyuki; Arai, Shigeo; Matsumura, Daiju; Nishihata, Yasuo; Atanassov, Plamen; Tanaka, Hirohisa
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AN

Publication date Jul 15, 2013

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Journal title	JN, PUB	jn("journal of power sources")	Journal names only. For complete Publication name types, use PUB. Displays in Publication title. Also searchable via the Look Up Citation tool for Publication name.
Language	LA	la(english)	The language in which the document was originally published.
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Number of pages	PCT	pct(8)	
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Patent application number	PA, PAT	pa("10/840183")	Displays in Patent information
Patent assignee	AP, PAT	ap(tata)	Displays in Patent information
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Subject ²	SU	su(catalysts)	
Updates	UD	ud(20130606)	
Volume	VO	vo(234)	

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