Área: ELE

Investigation of RhFe/C and Rh/C nanoparticles for nitrogen reduction reaction

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Highlights

The main product of N_2 electroreduction is ammonia;

The potential control allows producing other subproducts like N_2H_4;

Bimetallic material modifies the activity for NRR.

Abstract

The electroreduction of nitrogen to ammonia under temperature and ambient pressure has gained prominence since it provides an alternative to the reform process, drastically reducing CO_2 emissions via NH_3 synthesis. The nitrogen reduction reaction (NRR) was investigated using nanoparticles of Rh and RhFe catalysts dispersed in carbon. The polyol technique was utilized to synthesize Rh/C and RhFe/C catalysts with the same mean crystallite size. The reaction products were examined by UV-VIS using indophenol blue for ammonia detection and the *Watt and Chrisp* for hydrazine detection methods. Figure 1 shows the cyclic voltammetry results for the RhFe/C and Rh/C catalysts together with the x-ray diffraction (XRD) data. The XRD results confirmed the size of approximately 3 nm for both catalysts, showing that the polyol synthesis was adequate to obtain nanoparticles of the same size. The metallic alloy exhibits a more significant NRR catalytic activity.

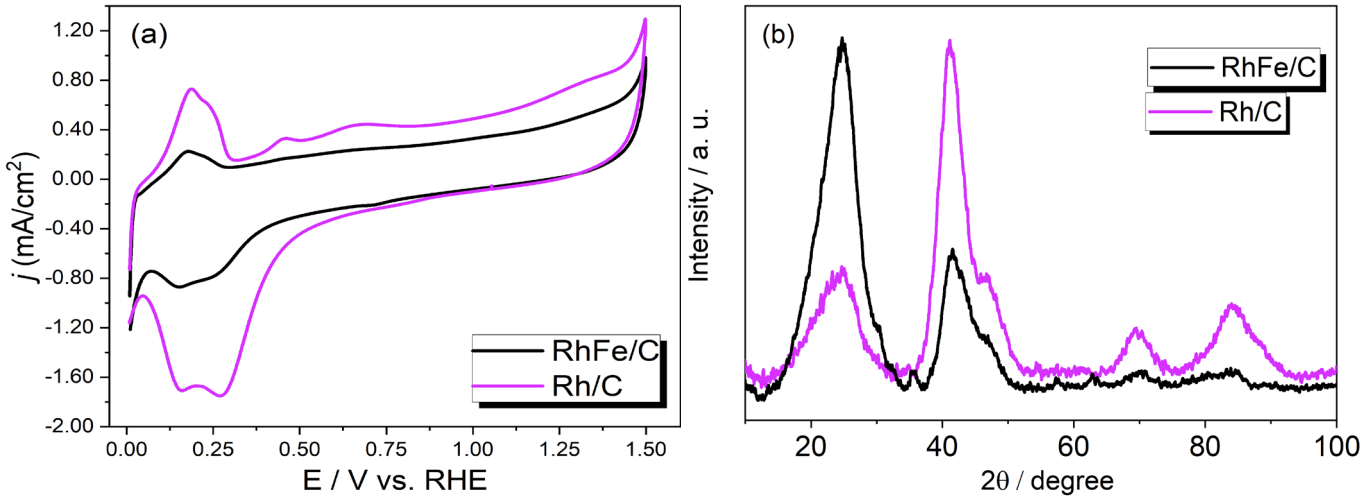

Figure 1. (a) Cyclic voltammetry of the material, (b) DRX analysis.

Acknowledgments

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