

TRANSITION METAL AND NITROGEN DOPED CARBIDE-DERIVED CARBON ELECTROCATALYSTS FOR ANION EXCHANGE MEMBRANE FUEL CELLS

Sander Ratso¹, Ivar Kruusenberg¹, Maike Käärrik¹, Mati Kook², Laurits Puust², Rando Saar², Petri Kanninen³, Tanja Kallio³, Jaan Leis², Kaido Tammeveski¹

¹*Institute of Chemistry, University of Tartu, Ravila 14a, 50411 Tartu, Estonia*

²*Institute of Physics, University of Tartu, W.Ostwaldi 1, 50411 Tartu, Estonia*

³*School of Chemical Engineering, Aalto University, FI-00076, Aalto, Espoo, Finland*

e-mail of presenting author: sander.ratso@ut.ee

Seeking suitable low-cost catalysts for fuel cells is one of the most important topics in modern electrocatalysis. This study presents non-precious metal catalysts made from titanium carbide derived carbon (CDC) doped with cobalt, iron and nitrogen for the cathode on anion exchange membrane fuel cells (AEMFCs). The catalysts were synthesised using high temperature pyrolysis of a mixture of the CDC, Fe or Co salts and dicyandiamide. A variety of physical characterization methods were used to study the morphology and elemental composition of the catalysts and the rotating disk electrode method was utilized for assessments of activity and stability towards oxygen reduction. The most active catalysts were then used as the cathode of single-cell AEMFCs [1,2].

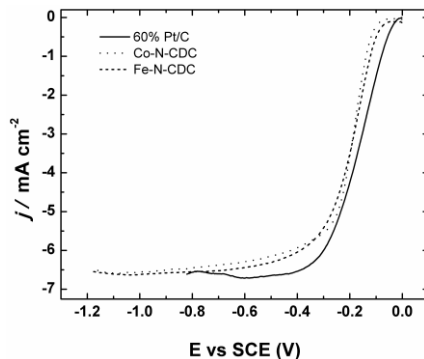


Fig.1 Comparison of the RDE results for O_2 reduction on Co-N-CDC, Fe-N-CDC and commercial Pt/C modified GC electrodes in O_2 -saturated 0.1 M KOH solution. $v = 10 \text{ mV s}^{-1}$, $\omega = 1900 \text{ rpm}$.

References

1. S. Ratso, I. Kruusenberg, M. Käärrik, M. Kook, R. Saar, P. Kanninen, T. Kallio, J. Leis, K. Tammeveski, 2017, *Appl. Catal. B Environ.* 219, 276–286.
2. S. Ratso, I. Kruusenberg, M. Käärrik, M. Kook, L. Puust, R. Saar, J. Leis, K. Tammeveski, 2018, *J. Power Sources* 375, 233–243.



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