Licensing / Technology Offer

Durable electrodes, hybrid capacitors & nanoreactors

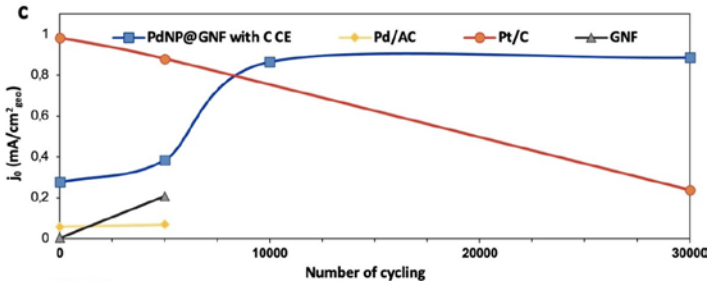
FunNanoMat Lab

CiQUS Center for Research on Biological Chemistry and Molecular Materials

Encapsulation of metal catalysts within commercial carbon nanofibers (nanocone structure)

Palladium NPs Hardwired in Carbon Nanoreactors *(HER - Hydrogen Evolution Reaction)*

- Continually increasing electrocatalytic activity during the HER
- The active metal centres becoming effectively hardwired into the electrically conducting nanoreactors (GNF)
- Tested over **30,000 cycles**



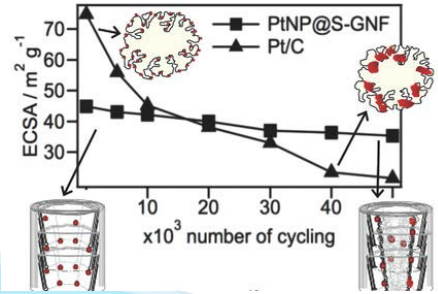
Change on the exchange current densities values of PdNP@GNF, GNF, Pt/C and Pd/C with potential cycling highlighting an increasing trend of the PdNP@GNF HER activity.

ChemSusChem **2021**, DOI: 10.1002/cssc.202101236

Extremely Stable Pt-Amorphous Carbon Electrocatalyst *(ORR - Oxygen Reduction Reaction)*

- Pt NPs inserted into shortened hollow carbon nanofibers
- Particles self-ordered at step-edges, preventing further growth (<6 nm)
- Practically unchanged after **50.000 potential cycles**

Adv. Mater., **2016**, 28, 41, 9103



▪ Ongoing patent application

ERC-Proof of Concept "*ZABCAT*" (2021—2023)

New Zn-Air Battery to Overcome Cathode Degradation Through Catalyst Confinement

ERC-StG "*NANOCOMP*" (2016—2022)

Dynamics of Clusters in High-Aspect Ratio Hollow Nanostructures