

# Nanomaterials production

## Thematic brokerage workshops

EU Brokerage Event on Kets in Horizon 2020

Strasbourg, 17th October 2017

# Danish Technological Institute (DTI)

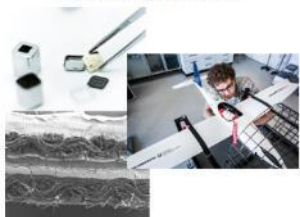
- **DTI** is the largest technological center provider in Denmark founded 110 years ago
  - More than 1,000 specialists with more than 10,000 customers a year from 65 countries
  - **EU project office** with responsibility for administrative, legal and financial aspects of all EU R&D projects
  - **25 EU projects currently on-going**, including Eureka Eurostar projects



DANISH  
TECHNOLOGICAL  
INSTITUTE

# Center for Nano Production and Micro Analysis

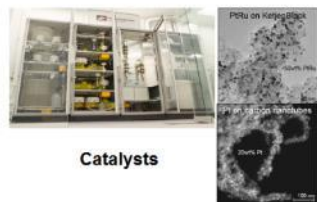
Fuel cells and drones



New business and big data



Nano-inks



Catalysts

Microanalysis



- **Catalysts**

- Customized productions (FCs, Exhausts, TWC)
- Washcoats
- Phys Chem Characterization
- Slurry preparation and coating of substrates
- Activity measurements in reactions
- Stability studies

- **Fuel cells for drones and hearing aids**

- Ink optimization
- Electrode and MEA fabrication
- Assembly of components & System integration
- Fuel cell testing and characterization

- **Nano-inks**

- Customized production (n-Ag, n-Cu)
- Formulation of conductive inks
- Digital printing

- **New business and big data**

- Automation
- Predictive maintenance
- Massive data collection and analysis

- **Microanalysis**

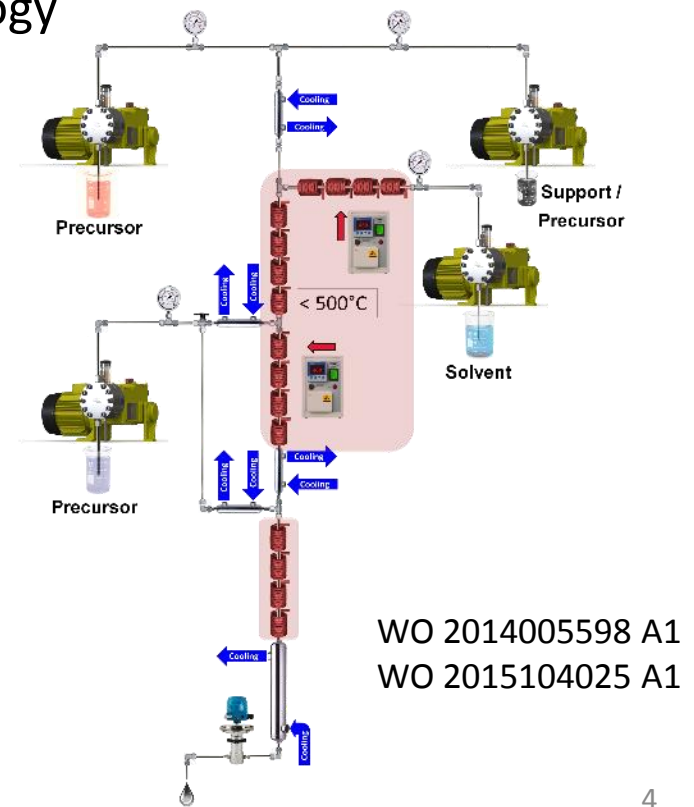
- Structural analysis (SEM, XRD, BET,  $\mu$ CT)
- Chemical analysis (EDX, FTIR, XPS, TOF-SIMS, TGA)
- Nanocoatings and laser structuring

# Synthesis of nanomaterials

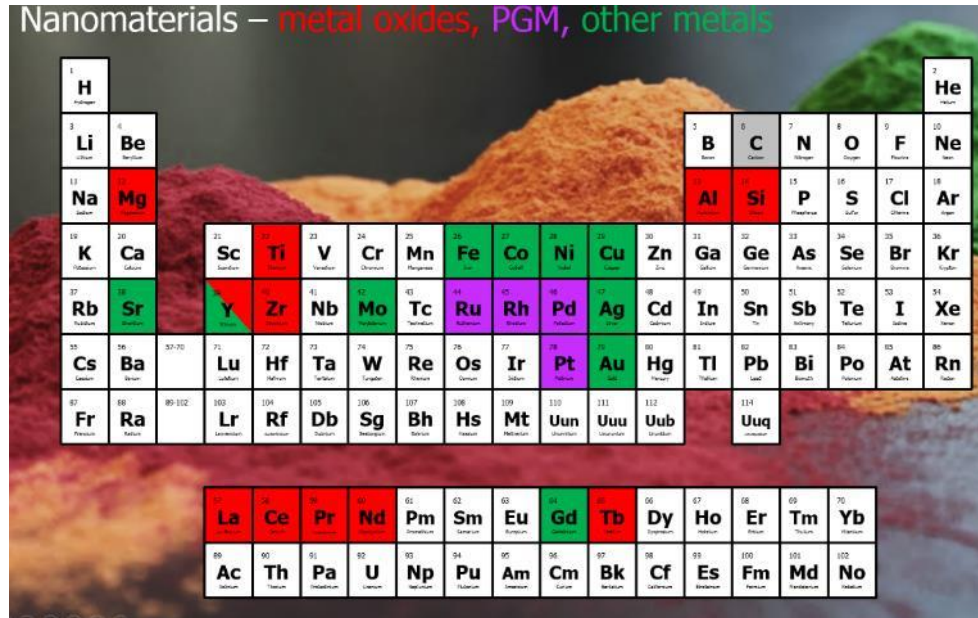
- **Pilot production of active and stable catalysts for different reactions and applications**
  - Reproducible, flexible, controllable synthesis and cost-effective
  - Supercritical/solvothermal flow technology



17/10/2017 - BE KETS



# Synthesis of nanomaterials



Fuel cell catalysts

Battery → Fuel cell

78 Pt Platinum	27 Co Cobalt	28 Ni Nickel
44 Ru Ruthenium	26 Fe Iron	42 Mo Molybdenum
39 Y Yttrium	64 Gd Gadolinium	46 Pd Palladium

Support

6 C Carbon
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Diesel oxidation catalysts

13 Al Aluminum	78 Pt Platinum	46 Pd Palladium	26 Fe Iron
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Three-way catalysts

58 Ce Cerium	40 Zr Zirconium	13 Al Aluminum	46 Pd Palladium	45 Rh Rhodium
57 La Lanthanum	59 Pr Praseodymium	60 Nd Neodymium		
12 Mg Magnesium	39 Y Yttrium	22 Ti Titanium		

# Contact details

Contact person	Patricia Hernandez-Fernandez
Organisation	Danish Technological Institute
Adress	Gregenservej 1 2630 Taastrup (Denmark)
Phone nr	+45 72 20 12 81
E-mail	pahf@teknologiks.dk