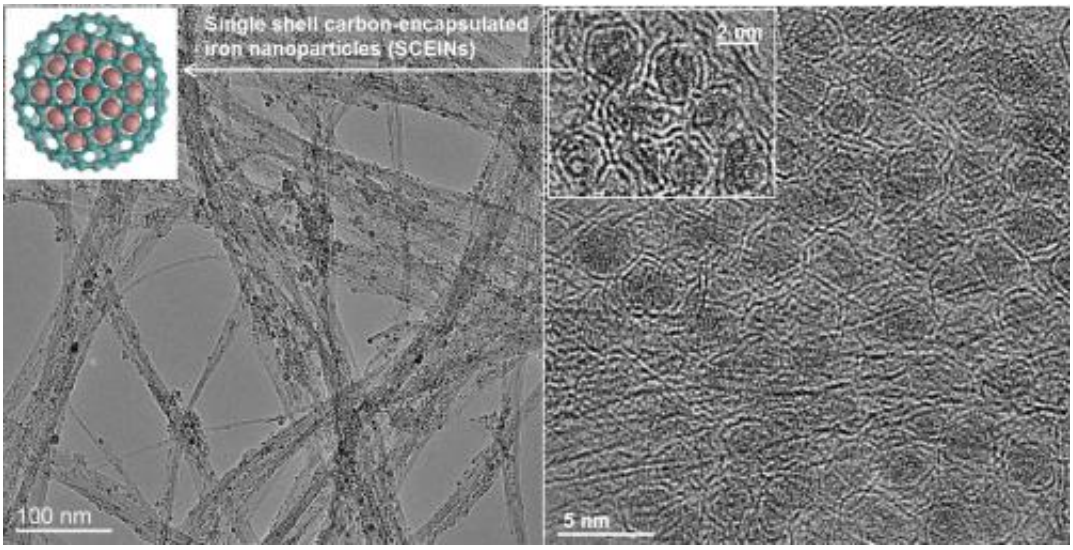
# Researchers developed a cost-effective and efficient rival for platinum

February 18 2015




Single shell carbon-encapsulated iron nanoparticles. Credit: Aalto University

Researchers succeeded in creating an electrocatalyst that is needed for storing electric energy made of carbon and iron.

A challenge that comes with the increased use of renewable energy is how to store electric energy.

Platinum has traditionally been used as the electrocatalyst in electrolysers that store electric energy as chemical compounds.However, platinum is a rare and expensive metal. Now Aalto University researchers have succeeded in developing a substitute to it that is cheap

and effective.

"We developed an electrocatalyst that is made of iron and carbon. Now the same efficiency that was achieved with platinum can be obtained with a less expensive material. Nearly 40 per cent of the material costs of energy storage with an electrolyser come from the electrocatalyst", says senior scientist Tanja Kallio.

The findings have just been published in the scientific journal *Angewandte Chemie* on 12 February 2015.

## Losses decrease

The manufacturing process has been developed in cooperation with a research group led by Professor Esko Kauppinen from Aalto University School of Science. The carbon nanotube the group developed conducts electricity extremely well and serves as the support, while the now added only single carbon layer covered iron functions as the catalyst. The manufacturing process has a single stage.

In the manufacturing phase, the iron is covered with graphene.

"The method has been altered to make the electro catalyst very active. By active, we refer to the small amount of energy needed to store electric energy as hydrogen. This reduces the losses caused by chemical storage and the process is economically viable."

Provided by Aalto University