

Nanoparticle coating of Pt manufactured with Coldab®

Challenge To increase the specific surface area of a Pt catalyst in a fuel cell application.

Solution Nano-particles of Pt deposited with Coldab®.

Background Platinum and transition metals are commonly used as catalysts. Pt is very efficient as a catalyst, but its widespread use is hampered by the high cost of the material. The catalytic action is related to the available surface area, so the material can be used in a more effective way if it is in the form of nanoparticles. It is necessary to simultaneously control size distribution, crystallinity and adhesion.

Results

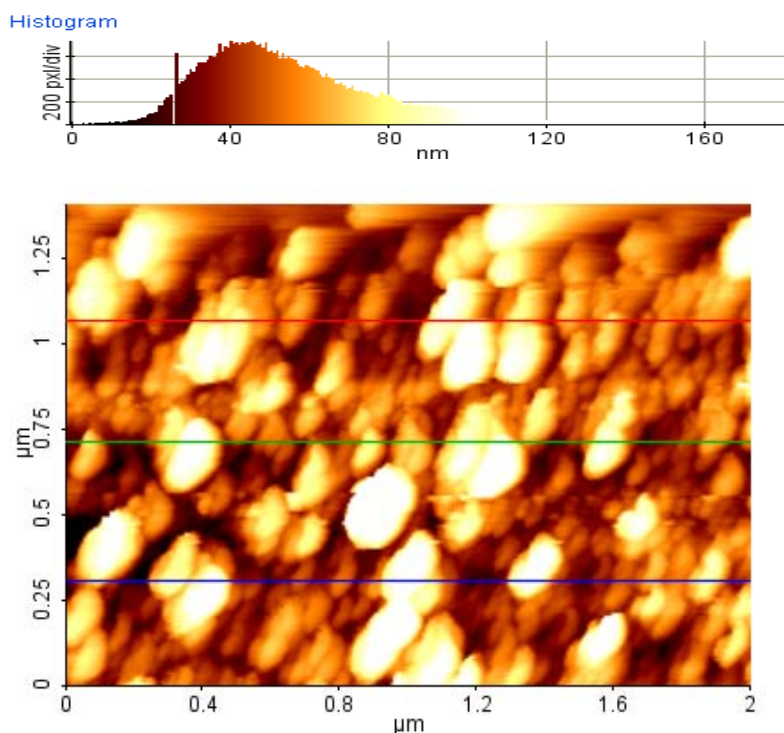


Figure 1. Nanostructured platinum for catalytic applications.

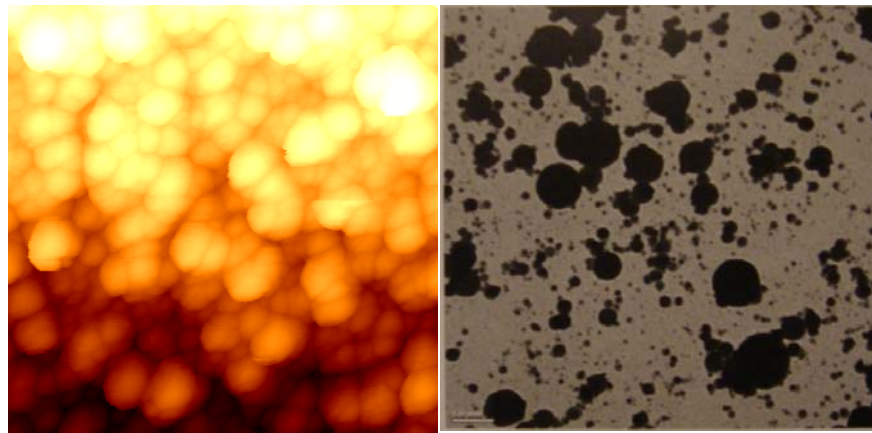
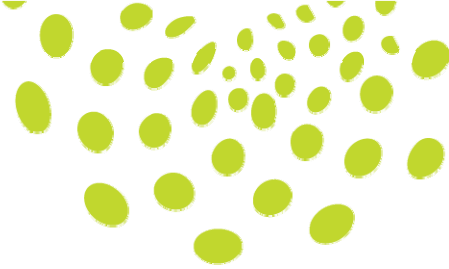


Figure 2. TEM characterization (right) showed good agreement with AFM characterization (left), i.e. particle size (31.7 ± 18.9 nm (mean \pm st. dev.))

Coldab® advantages

1. Precise control of the size of deposited nanoparticles
2. Control of crystallinity of the deposited material
3. Superior adhesion of the deposited layers
4. Efficient use of expensive source material
5. Ability to implement the process on an industrial scale

Fields of use

The production of most industrially important chemicals uses catalysts. Catalysts are also used in fuel cells.

Picodeon's patented Coldab® laser deposition technology offers the unique benefit of being able to deposit virtually any type of layer on any type of material. We can now do what was impossible before. Layers include diverse functional thin films and coatings with strong adhesion to heat-sensitive materials like plastic and paper. In addition, Coldab® promotes cost-effective and environmentally friendly production through shorter cycle time, energy-saving, low vacuum and expanding surface production from