

# CarboCat



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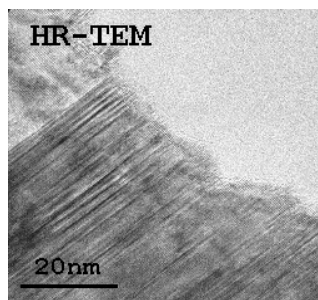
**CarboCat** is a platinumized catalyst material based on carbon nanoparticles. Our special metal deposition process produces optimal dispersion of platinum particles on the carbon nanoparticles, while the high oxidation stability ensures reduced aging effects.

The special properties of **CarboCat** stem from the use of carbon nanoparticles (platelet type, abbreviated CNF-PL) as a high-efficiency catalyst material plus the deposition process developed by FutureCarbon.

Compared to conventional catalysts, the material exhibits the following properties:

- The high stability of the substrate material against oxidation produces very high long-term stability of the catalyst, which shows its worth in particular in the case of high-temperature fuel cells (HT-PEM).
- The specific surface of CNF-PL (by BET) is in the region of 130 m<sup>2</sup>/g (effective as a catalytically active surface).

Illustrated on the right is a TEM picture of the carbon nanoparticles (CNF-PL). The staggered surface structure makes them optimally suited as a catalyst substrate material.

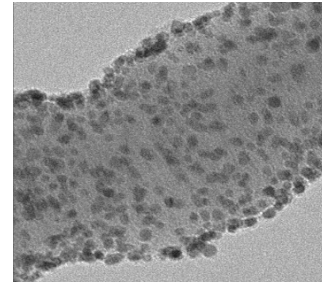


**CarboCat** is simply dispersed and creates porous layers of good adhesion, e.g. in membrane electrode units. **CarboCat** dispersions can be applied by the usual methods, and also combined with other materials.

The unique FutureCarbon deposition process optimally binds platinum particles to the substrate. It is general-purpose and also suitable for the deposition of many other metals.

In the righthand picture the extremely fine Pt particles deposited on CNF-PL are visible.

They exhibit high stability (reduced tendency to coalesce).



**CarboCat** comes to standard with Pt weight proportions of 20% and 30%. Pt particle size is approx. 3 nm for **CarboCat** PL-Pt 20% and approx. 4 nm for **CarboCat** PL-Pt 30%.

A variety of special versions are also available:

- alternative substrate materials: carbon nanotubes (CNT-MW) and other nanoparticles (e.g. CNF-HB),
- differing metal content (e.g. 5% platinum as a hydrogenating catalyst with special selectivity),
- combinations with ruthenium as a PtRu alloy catalyst,
- alternative deposition of palladium particles.

**CarboCat** is optimized for application in both low-temperature and high-temperature PEM fuel cells.

**CarboCat** is suitable as a catalyst for highly selective hydrogenation reactions in which C=O bonds in particular are hydrogenated but C=C bonds are sustained.

In addition to its catalyst application, **CarboCat** serves as a mediator layer in the field of carbon nanoparticle composites.

**CarboCat** comes optionally as powder or dispersed in a variety of solvents.