Metal Nanoparticles for the European Industry

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Target
- synthesis of metal nanoparticles e.g. Cu, Ag, Co
- nanosized grain size, high uniformity and big specific surface
- better in many applications than commonly used metal powders

Idea and method
- ultrasonic spray of water-solutions of metal salts (aerosol formation)
- hydrogen gas reduction or thermal decomposition
- use of various metal salt solutions as precursor

Principle of ultrasonic spray pyrolysis USP

Ultrasonic spray pyrolysis equipment

Copper nanoparticles
- Metal catalysts e.g. Me (Ag, Cu, Co) / ZnO/ Al₂O₃ are industrially employed for methanol synthesis and the water gas shift reaction. The strong increase in catalytic activity is a consequence of the resulting higher metal surface area if nanoparticles are used.

Silver nanoparticles
- Nanoparticles e.g. of silver may be also used to protect bacterial influence. Nanosized particles have reduced melting and sintering temperatures compared to micron-sized particles and open new applications and processing alternatives.

Cobalt nanoparticles
- Nanosized particles of copper could be used as an additive in lubricants for the minimization of an attrition.

In the future applications of metal nanoparticles is expected also in environmental protection.

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