

The Size control of ultrafine metal particles by Salt-assisted Aerosol Decomposition

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Ultrafine particles (< 200 nm) are of interest, because the chemical and physical characteristics of the particles are remarkably different from those in bulk form. Especially, ultrafine metal particles have shown to exhibit unusual ductility and to undergo optically and chemically induced shape changes.

In this report, ultrafine metal particles were prepared by SAD (Salt-assisted Aerosol Decomposition). Usually, particles prepared by CAD (Conventional Aerosol Decomposition) are a few micrometers in diameter, whereas SAD produces particles less than 200nm in diameter. Salts such as eutectic salts (potassium and sodium nitrates) and sodium chloride prevent particles from agglomeration and reduce particle size. The influence of various operating conditions such as temperatures, type of salts and salt composition was investigated. The composition, morphology and size of particles were characterized by XRD (X-ray diffraction), SEM (Scanning electron microscope) and TEM (Transmission electron microscope), respectively.