

化学还原法制备纳米级Ag粉高分子保护机理研究

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**摘要** 本文研究了化学还原法制备纳米级Ag粉的高分子保护机理,实验结果显示聚乙烯吡咯烷酮(PVP)能有效地阻止颗粒团聚并降低Ag晶粒尺寸,得到近单分散200nm以下的Ag粉。PVP的保护机制为:第一步,PVP与Ag<sup>+</sup>形成配位键。第二步,配位键促进Ag颗粒成核。第三步,形成大量小晶核使Ag颗粒平均尺寸减小,而PVP吸附在Ag颗粒表面形成位阻效应阻止了颗粒团聚。

**关键词** [紫外分光光度法](#) [银](#) [红外分光光度法](#) [还原](#) [聚乙烯吡咯烷酮](#) [纳米相材料](#)

分类号 [TQ11](#)

## Polymer protective mechanism of nanometer silver powder prepared by chemical reduction method

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**Abstract** Nanometer silver grain growth and particle's aggregation were effectively prohibited by polyvinyl pyrrolidone (PVP) when the silver powder prepared from silver nitride solution reduced by hydrazine hydrate. On the base of ultraviolet spectra and FTIR spectra measurement, PVP protecting mechanisms proposed in this paper were that, first, the coordinative bonds were formed between PVP and silver ions; secondly, a large number of silver embryos were generated during the initial reaction period due to the coordinative bonds formation; and finally, silver embryos and the PVP steric effects were responsible for the inhibited grain growth and the grain aggregation of silver particles.

**Key words** [ULTRAVIOLET SPECTROPHOTOMETRY](#) [SILVER](#) [INFRARED SPECTROPHOTOMETRY](#) [REDUCTION](#) [POLYVINYLPIRROLIDONE](#) [NANOPHASE MATERIALS](#)

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