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表面活性剂对超细银粉分散性能的影响

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摘要: 在以抗坏血酸为还原剂、银氨配合物为前驱体、PVP为保护剂及表面活性剂为分散剂的液相化学还原体系中制备超细银粉, 研究阳离子、阴离子和非离子表面活性剂在银粉制备过程中的防团聚作用和分散作用, 并采用扫描电镜(SEM)和X射线衍射等对还原产物进行形貌观察和结构表征。结果表明: 表面活性剂的种类对制备样品的纯度、分散性和颗粒大小有着重要的影响, 其中阳离子表面活性剂和阴离子表面活性剂的分散效果不明显, 非离子表面活性剂的分散效果最好。对吐温(TW)系列分散剂的研究表明: TW相对分子质量的大小对银粉颗粒的分散效果、形貌和大小也有显著影响; 采用TW80分散剂可制备出高分散、窄粒级的超细银粉。

关键字: 超细银粉; 表面活性剂; 抗团聚; 分散

Effects of surfactants on dispersive performance of ultrafine silver powder

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Abstract: The preparation of ultrafine silver powder was investigated by reducing $\text{Ag}(\text{NH}_3)_2^+$ with ascorbic acid in the presence of poly-(vinylpyrrolidone) (PVP) as protective agent and surfactants as dispersant. The effects of cation, anion, and non-ion surfactants on aggregation-proof and dispersion of silver particles in the preparing silver powder were investigated, and the pattern and phase of reducing products were also characterized by scanning electron microscopy (SEM) and X-ray diffractometry (XRD). The results show that the surfactant species impact apparently on the purity, dispersion degree and particle size of the reducing sample. The non-ion surfactants can improve the dissemination of ultrafine silver particles, but both the dispersive effects of cation and anion surfactants are unapparent. Moreover, the results of reducing experiments with a series of TW surfactants show that the relative molecular mass of TW affects the dissemination, pattern and size of silver

particles, and the well-dispersed ultrafine silver powder with narrow size distribution can be prepared in the presence of TW 80 surfactant.

Key words: ultrafine silver powder; surfactant; aggregation-proof; dispersion

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