

Site-Selective Deposition of Silver Nanoparticles Using Modified Silver Mirror Reaction and Surface Modification by Self-Assembled Monolayer

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We developed a set of processes for depositing silver nanoparticles on a glass substrate that involves using a modified silver mirror reaction, whereby dispersants are added to a conventional silver mirror solution. The whole set of processes was completed in 15 min in a nonvacuum environment, except the cleaning processes with oxygen plasma at 20 Pa, and at a low cost. The processes can be applied to the site-selective deposition of silver nanoparticles by modifying the surface characteristics of glass substrates using a self-assembled monolayer (SAM). We used a microcontact printing method that incorporated a non-photolithographic top-down process to pattern a SAM. The proposed processes are readily applicable to promising applications of metal nanoparticles, such as ultrasensitive sensors and catalysts.

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