

## **Photochemical transformation of silver nanoparticles by combining blue and green irradiation**

Cardoso-Ávila, P.E ; Pichardo-Molina, J.L; Krishna, C.M.; Castro-Beltrán, R.

**Journal of Nanoparticle Research** Vol. 17:160

March 2015

doi:10.1007/s11051-015-2920-x

### **Abstract**

Spherical silver nanoparticles (diameter 3 nm) were transformed by means of photochemical synthesis using superluminescent LEDs. Flat rounded (21 nm) and decahedral nanoparticles (78 nm) were, respectively, obtained when the colloid was exposed to green and blue radiation. Furthermore, by changing from blue to green radiation at different exposure times, various morphologies and sizes were obtained. Exposure times shorter than 30 min of blue radiation followed by green radiation resulted on different morphologies such as twine rounded (42 nm), flat elongated (peanuts, 17 nm), and flat rounded nanoparticles (11 and 24 nm). Times longer than 45 min produced decahedral nanoparticles with corners ranging from rounded to sharp (size 71–78 nm). Additionally, these results showed that by controlling morphologies and sizes through the combination of blue and green light at different exposure times, it was possible to tune the plasmon band from 511 to 594 nm. Moreover, controlling the morphology of nanoparticles is of prime importance in order to exploit their properties as part of novel emerging technologies.