

Luminescent nanocrystalline silicon particles with biocompatibility for cosmetic application

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We have developed photoluminescent stable silicon nanocrystals (nc-Si) which have attracted great interest as quantum dots due to their nontoxic, abundant, and low-cost materials. The nc-Si particles show visible luminescent properties caused by a radiative recombination of electrons and holes in the Si-nc. The emitted colours can be tuned by changing the size of the nc-Si. In order to know the limit concentration for cytotoxicity, we investigated the response of HeLa cells. We detected a toxicity of nc-Si at 1,120 $\mu\text{g/mL}$. We suggested one of the mechanisms that nc-Si can generate oxygen radicals and the radicals were associated with membrane damages.