

Catalytic and biological sensitivity of TiO₂ and SiO₂ matrices with silver nanoparticles created by ion implantation: A review

Stepanov A., Xiao X., Ren F., Kavetsky T., Osin Y.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The ion implantation of oxide materials such as TiO₂ and SiO₂ to form silver nanoparticles for catalyst and antibacterial applications is observed. For these purposes the implantation was used at high ion doses that is essential for silver nanoparticle nucleation and grow. It is considered how implanted silver nanoparticles can modify various oxide materials in dependence of irradiation conditions such as ion dose, energy, current density and so on. Some examples of various chemical catalytic and antibacterial reactions in samples with nanoparticles Ag:TiO₂ and Ag:SiO₂ are also presented and discussed. It is demonstrated that ion implantation is one of effective perspective modern techniques for fabrication catalyst and biology-active materials with silver nanoparticles. © 2013 Advanced Study Center Co. Ltd.
