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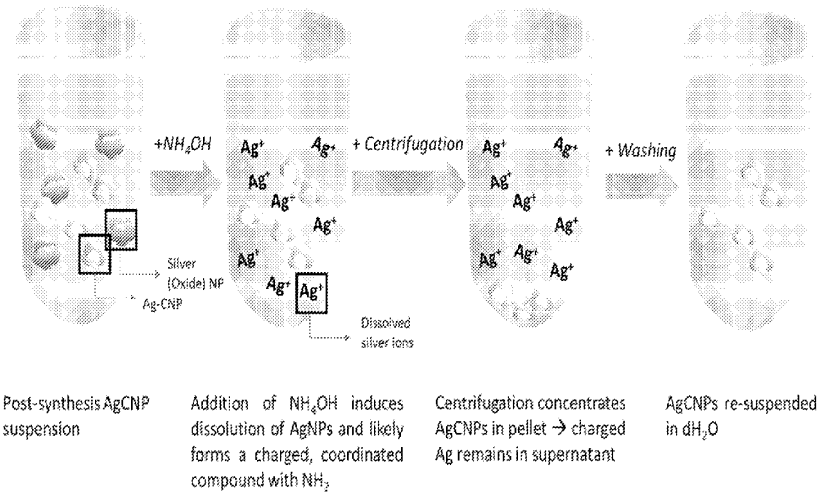
(54) Title: CERIA NANOPARTICLES WITH SUPERIOR ADHESION AND ANTIMICROBIAL SURFACE ACTIVITY

FIG. 1



(57) Abstract: Community-associated and hospital acquired infections caused by bacteria and viruses on surfaces are global challenges to human health. New strategies that offer non-specific and broad protection are urgently needed. Irradiated cerium nanoparticles IrCNPs are provided which optionally are synthesized with a metal such as silver. These nanoparticles are designed to have superior function due to a higher trivalent (Ce^{3+}) surface fraction, which produces high potency and residual effects on a variety of surfaces. Preferred IrCNPs can rapidly and completely eradiate *Pseudomonas aeruginosa, Staphylococcus aureus*, and methicillin resistant *S. aureus*, both species and biofilm, within 3 hours of exposure, and are effective against viruses as well.

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