Silver ions eluted from partially protected silver nanoparticles

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The most prominent character of a new type of antibacterial urological catheters is the zebra-stripe pattern of a silver film, which is plated electroless on their interior wall and capped by a very thin semipermeable layer of parylene. This design effectively controls the release rate of Ag^+ ions in artificial urine, which has been measured as function of time with optical emission spectroscopy. By evaluating the minimum inhibitory concentration against certain strains of bacteria with solutions of $AgNO_3$ of known concentration with the method of optical density and applying this analysis to the silver-eluting catheters, it was shown that this moderation prolongs the period of their application significantly. But to act as antibacterial agent in chlorine-containing solutions, as in urine, the presence of urea is required to avoid precipitation of AgCl and to meet or even exceed the minimum inhibitory concentration of Ag^+. The quality of the silver depot layer was further determined by the deposition rate and its morphology, which revealed that the film consisted of grains with a mean size of 150 nm.
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