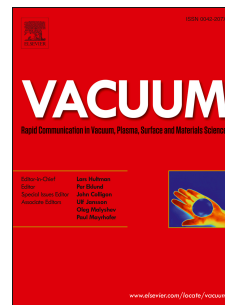


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Synthesis of silver–hydroxyapatite composite with improved antibacterial properties

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Abstract Hydroxyapatite is an important biomaterial for potential clinical applications. However, the lack of antibacterial activity restricts its application. To overcome this defect, here we prepared a silver-incorporated hydroxyapatite composite, **Ag–HA**, and tested its antibacterial properties. Via the chemical precipitation of the suspension of chitosan, CaCl_2 and NaH_2PO_4 , an intermediate, chitosan-hydroxyapatite composite **CS–HA**, was obtained. After the reduction of AgNO_3 in **CS–HA** suspension by NaBH_4 , centrifugation and calcination, **Ag–HA** was collected. As the reference materials of **Ag–HA**, the hydroxyapatite particle **HA-2** was gained via the calcination of **CS–HA**. To illustrate the role of chitosan in the preparation, the hydroxyapatite particle **HA-1** was also synthesized with a similar method to **HA-2** except for the use of chitosan. Powder X-ray diffraction, X-ray photoelectron spectroscopy, fourier transform–infrared spectroscopy, and scanning electron microscope were used to confirm and character **Ag–HA**, **HA-1** and **HA-2**. We found, by using chitosan, **Ag–HA** and **HA-2** had more regular morphology than that of **HA-1**. The antimicrobial activities of **Ag–HA** and **HA-2** against Gram-positive *Staphylococcus aureus* and

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