

Silver/Silicone Nanofilament Composite Coated Glass Beads for Point-of-Use Water Filtration

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Safe and reliable drinking water is of vital importance. However, there are areas on earth where the sustainable access to potable water is not guaranteed. This shortage can lead to severe disease outbreak. Using a point-of-use water filter is one possibility to prevent the transmission of waterborne diseases by pathogens. Nanomaterials are more and more frequently used for such filters due to their high surface area and small pore size. Moreover, nanomaterials provide opportunities to develop chlorine-free biocides.

Silicone nanofilaments (SNFs) have a high surface area and form a quasi-porous structure. Furthermore, this nontoxic material can easily be functionalized and its synthesis is inexpensive and facile [1, 2]. These assets along with their chemical stability make SNFs an ideal basis for water filtration. Thus, we coated glass beads with this versatile nanomaterial using chemical vapor deposition. The SNFs coated glass beads were functionalized by silver nanoparticles, which are well known for their biocidal activity. Flow tests with bacteria contaminated water are used to evaluate the efficiency of this newly created and cost-effective SNF-based filter material.

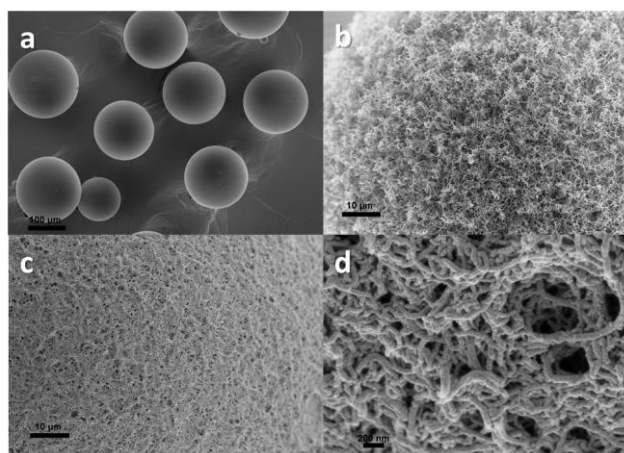


Fig.1 SEM micrographs of (a) glass beads (b) glass beads coated with SNFs before functionalization with silver nanoparticles and (c, d) silver nanoparticle decorated

References

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2. G. R. Meseck, A. Käch, S. Seeger, *J. Phys. Chem. C* **118**, 24967 (2014)