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Impact of solution chemistry on the properties and bactericidal activity of silver nanoparticles decorated on superabsorbent cryogels

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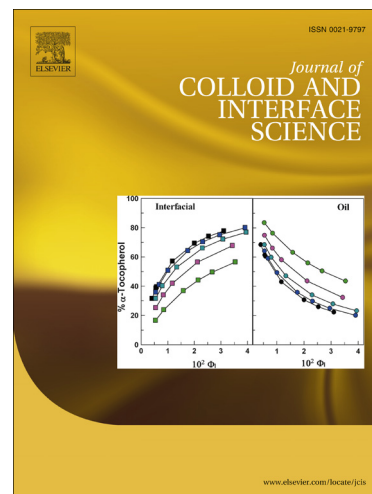
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17
18 **Abstract**

19 This study investigated the effects of dissolved organic matter (DOM) and various
20 electrolytes commonly found in environmental aqueous matrices on the physicochemical
21 properties and bactericidal efficacy of silver nanoparticles (AgNPs), which are immobilized
22 on cryogels (or PSA/AgNP cryogel). The AgNPs in the PSA/AgNP cryogel that were
23 exposed to different media underwent morphological transformation in terms of particle size
24 and structure. In addition, the presence of DOM and electrolytes increased the release of
25 dissolved Ag. The biological uptake of Ag species (determined as the total Ag in exposed
26 cells) increased in the presence of DOM, but decreased in the presence of electrolytes. The
27 presence of electrolytes did not result in any significant reduction in the bactericidal activity.
28 Although an initial increase of the DOM to 2.5 mg-C L⁻¹ attenuated the bactericidal efficacy
29 of the immobilized AgNPs, an increase in the DOM concentration beyond 5 mg-C L⁻¹

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