

Antibacterial Coating Materials Based On Quaternary Ammonium Surfmers

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For common water based emulsion polymerization the use of surfactants is required for the formation of self-assembled molecular clusters above the critical micelle concentration (CMC). Surfmers are surfactants that carry a polymerizable unit and are incorporated into the polymer structure. In addition to minimizing waste, the use of surfmers offers the advantage of obtaining surface-active polymer films.

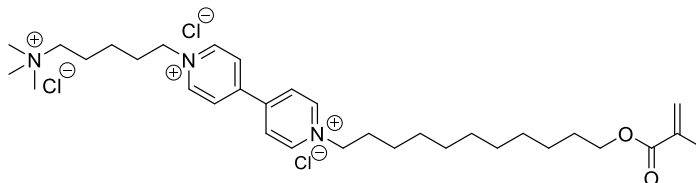


Figure 1: Bactericidal surfmer from C. Henschke with the quaternary ammonium head group.^[1]

The surfmer presented here contains quaternary ammonium and bipyridinium ions, which are known for their antibacterial effect. By incorporating them into a polymer, antibacterial coating materials can be produced. A polymer film of the shown surfmer was tested for its antibacterial activity against *Staphylococcus aureus* in a standard test (incubation for 24 hours at 35°C) and showed a germ reduction of 6.1 log levels. Based on the good efficacy of the latex, it is a promising candidate for a wide range of applications, for example in the medical field. Especially in times of the increased occurrence of multi-resistant germs. In addition, the use of cross-linkers has increased the resistance of the films.

References:

- [1] S. Höger, C. Henschke (2023) *Pyridiniumverbindung* (DE 10 2022 102 453.9). Deutsches Patent- und Markenamt.
<https://register.dpma.de/DPMAregister/pat/register?AKZ=1020221024539&CURSOR=45>