# New quaternary ammonium surfmer

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Conventional water-based emulsion polymerisation requires the use of surfactants to form self-assembled molecular clusters above the critical micelle concentration (CMC). Surfmers are surfactants that carry a polymerisable moiety. They are incorporated into the polymer structure. The use of surfmers offers the advantage of obtaining surface active polymer films in addition to minimising waste.

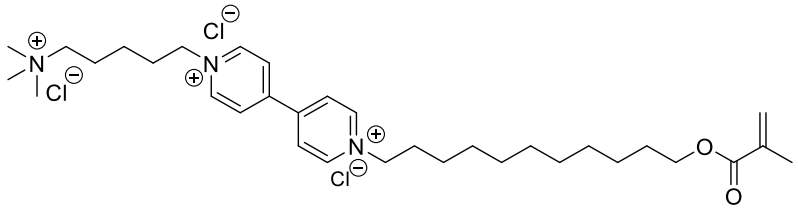


**Figure 1:** Chemical formula of quaternary ammonium surfmer.

The new surfmer contains quaternary ammonium and bipyridinium ions that are known to have antimicrobial properties (Figure 1). Their incorporation into a polymer can be the basis for the production of antibacterial coatings. A polymer film of the shown surfactant 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. This is particularly important in an era of the rise of multi-resistant bacteria. In addition, the use of cross-linkers has increased the resistance of the films.

References:

[1] C. Henschke, Dissertation, Friedrich-Wilhelms-Universität Bonn, unpublished results.
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