

Bacterial Decolorization of Acid Orange 7 in the Presence of Ionic and Non-Ionic Surfactants

Tatyana Avramova, Lilyana Stefanova, Blaga Angelova, and Sava Mutafov*

Bulgarian Academy of Sciences, The Stephan Angeloff Institute of Microbiology,
Acad. G. Bonchev St., Block 26, 1113 Sofia, Bulgaria. Fax: +3 59 28 70 01 09.

E-mail: mutafov@microbio.bas.bg

* Author for correspondence and reprint requests

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The effects of the non-ionic surfactant Triton® X-100, the cationic surfactant cetyltrimethylammonium bromide (CTAB) and the anionic surfactant sodium *N*-lauroyl sarcosinate (SLS) on the decolorization of the reaction medium containing the monoazo dye Acid Orange 7 (AO7) by *Alcaligenes faecalis* and *Rhodococcus erythropolis* were studied. It was found that the surfactants influenced in different ways the rate of decolorization. At all concentrations tested the non-ionic surfactant Triton X-100 decreased the decolorization rate of *R. erythropolis*. At concentrations above the critical micelle concentration (CMC) Triton X-100 upset the usually observed exponential decay of the dye with *A. faecalis* due probably to the existence of an outer membrane in this organism. In concentrations above the CMC the anionic surfactant SLS inhibited the decolorization and, at prolonged incubation, caused partial release of the bound dye. The cationic surfactant CTAB in concentrations above and below the CMC accelerated drastically the binding of AO7 to the cells causing a rapid staining of the biomass and complete decolorization of the reaction medium. An attempt was made for explanation of the observed differences by the negative electrostatic charge of the living bacterial cell.

Key words: Azo Dyes, Biodegradation, Decolorization