

Biosorption of diethylketone and Cd using a *Streptococcus equisimilis* biofilm supported on vermiculite: kinetics and equilibrium studies

Filomena Costa *, Bruna Silva, Teresa Tavares

Departamento de Engenharia Biológica, Universidade do Minho, Campus de Gualtar 4710-057 Braga Portugal

ABSTRACT

This work aims to infer about the possible application of a supported biofilm on the simultaneous removal of a metal and a ketone from aqueous solutions and accordingly it describes two sets of experiments: cadmium and diethylketone, DEK, adsorption assays on vermiculite, the support, and cadmium and diethylketone biosorption assays on vermiculite covered by a *S. equisimilis* biofilm. Removal percentages between 60 % and 98 % were obtained by the vermiculite for initial concentrations of 3g/L of DEK. For Cd, the removal percentage ranged between 72 % and 78% for initial concentrations of 0.1 g/L of metal. Regarding the assays conducted with the *S. equisimilis* biofilm supported on vermiculite, the percentage of removed cadmium increases with the increase of the amount of vermiculite whereas DEK removal decreases (maximum removals of 86.16 % and 95.70 % for Cd and DEK, respectively). Adsorption kinetics for both pollutants follows the pseudo-second order model and equilibria are well described by the Freundlich and by the Dubinin-Radushkevich models for Cd and DEK respectively.

Key words: *Streptococcus equisimilis*; vermiculite; cadmium; diethylketone; biosorption.

* Corresponding Author