

BIOFILM FORMATION BY *Pseudomonas fluorescens* ON METALLIC SURFACES

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The applications of biofilms, including microbial, plant and cell biofilm systems, have been increasing in biotechnology. The immobilized cells can be used to produce a given compound or to degrade undesirable ones.

However, there are situations where biofilms are unwanted, being generally referred to as biofouling. This phenomenon is specially relevant when it occurs on heat transfer surfaces, mainly in cooling water systems, giving rise to important economical losses.

Whatever is the case, it is necessary to have a better insight on the phenomenon of biofilm formation in order to make possible a certain control of the process.

The aim of this work was to study the formation of biofilms by *Pseudomonas fluorescens*, a natural water bacterium, on metallic surfaces (copper, aluminium and brass) in a flow system. The results are discussed in terms of the mechanisms (transport and / or adhesion) that may control the rate of the deposition process. Adhesion data are compared with the predictions given by thermodynamic models. The effects of metallic ions (Cu^{2+} , Zn^{2+} and Al^{3+}) on the bacterial metabolism were studied in order to explain the discrepancies between experimental data and thermodynamic predictions.