

# Biofilm Corrosion

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Biofouling and biocorrosion occur in terrestrial and in aquatic habitats with varying environmental conditions. Interfacial chemistry assumes the existence of a wide variety of physiological activities caused by a diverse microbial population growing inside a biofilm. Microorganisms, mainly bacteria are the primary colonizers of submerged surfaces. Microbial colonization of a surface is afforded by the production of extracellular polymeric substances (EPS) which comprise different macromolecules for instance proteins, polysaccharides, nucleic acids and lipids (ZINKEVICH et al., 1996). The yield and the constituent parts of EPS vary dependent on environmental conditions and presence of microbial species. EPS afford microbial attachment to the substratum and develop the “*dynamic biofilm matrix*” and in this connection polysaccharides are “*proposed to act as fundamental structured elements responsible for the mechanical stability of a biofilm*” (WINENGER et al., 1999).

It is well-known that microorganisms produce a wide range of enzymes and the release of these enzymes into the external environment provides the basis for the interaction between substrates and microbes (BEECH, SUNNER and HIRAOKA, 2005). An overview about the techniques for the characterization to investigate these processes is given by BEECH, SUNNER and HIRAOKA (2005).

Biocorrosion is seldom linked to a distinct mechanism or to a single microbial species. The many types of microorganisms found in this connection belong to the group of sulfate-reducing bacteria, sulphur-oxidising bacteria, iron-oxidising and/or reducing bacteria and manganese oxidising bacteria. Added with organic acid secreting and slime secreting bacteria (BEECH, 1999). The mentioned microorganisms are ubiquitous and their detection needs specific investigation techniques, because a lot of them are in a viable but not culturable (VNBC) status.

As DOWLING et al. (1991) described, these microorganisms mostly co-exist in biofilms forming a synergistic population. There they are able to execute electro-chemical processes due to cooperative metabolisms which a single species hardly can initiate or maintain.

## Literature

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