

Department of Chemistry

Deeper Insights into SRB-driven Biocorrosion

REQUIMTE-CQFB / Biological Chemistry Group



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(Student)

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- Bachelor degree in Biology (UFPA)
- Master in Genetics and Molecular Biology (UFPA)
- PhD degree in Sustainable Chemistry (UNL) - Ongoing

Objectives

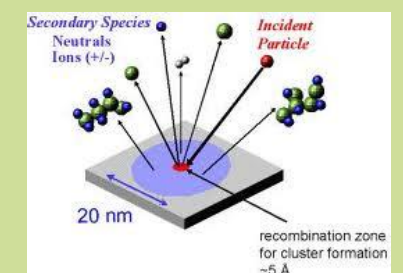
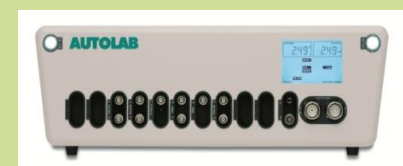
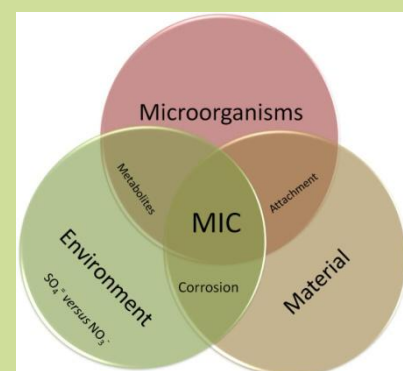
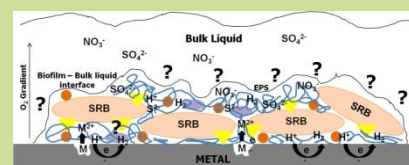
- Development of a SRB driven corrosion model on carbon steel with *Desulfovibrio desulfuricans* ATCC 27774.
- Biomining of molecules involved in the biocorrosion process (attachment, electron transfer, biofilm formation, etc).
- Evaluation of nitrate effects in the corrosion process by protein profile and surface analysis.

Methodology

- Electrochemistry of biofilm and ExoPolymeric Substances (EPS) on carbon steel.
- EPS characterization (quantification of components by colorimetric assays) and analysis of protein profile by SDS-PAGE and MALDI-ToF.
- Weight loss tests in different conditions.
- Surface analysis of corroded carbon steel using XPS, ToF-SIMS and SEM-EDX.
- Adsorption studies of proteins using QCM-D, XPS and ToF-SIMS.

Expected Results

- Proteins are the main component of EPS that adsorbs in the surface and have implications to the bacterial attachment.
- Nitrate has major influence in the corrosion evolution and type.
- In some conditions sulfide can be protective to the metal.
- The EPS aggressiveness to the metals can vary depending on the respiratory substrate.



Funding:

