

New challenges and prospectives for tribocorrosion science

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The description of tribocorrosion phenomena and mechanisms through tailored experimental approaches and theoretical models has allowed gaining understanding in the response of materials operating under different tribological contacts in reactive environments. At present, the complex interactions between chemical and mechanical phenomena have been rationalized through comprehensive models (analytical and numerical) mainly for passive materials assuming that wear is the consequence of plastic deformation of asperity contacts. Other situations, when third bodies are formed as in the case of high temperature conditions, have been also described by considering wear as a mass flow and not simply a material loss.

New technological challenges in terms of extreme environments (i.e. hydrogen, ammonia, low speeds, high temperature), materials (composites, multiphase, multicomponent, multilayer) or lubrication methods (water based, gels) requires for a deeper understanding of the link between the involved chemical, mechanical and material phenomena. In particular, the interaction between surface properties (including chemistry but also microstructure) and wear, friction and lubrication as a function of mechanical and chemical conditions needs to be further described.

In this talk, an overview of the scientific questions to be addressed in the field of tribocorrosion will be presented. Several case studies will be used to illustrate future advances in tribocorrosion science.

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