

Physico-chemistry

Chemical properties and corrosion

IDENTIFICATION

CODE : SGM-4-S1-CORROD
ECTS : 2.0

HOURS

Lectures : 14.0 h
Seminars : 10.0 h
Laboratory : 0.0 h
Project : 0.0 h
Teacher-student
contact : 24.0 h
Personal work : 36.0 h
Total : 60.0 h

ASSESSMENT METHOD

TEACHING AIDS

TEACHING LANGUAGE

French

CONTACT

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AIMS

Basic knowledge in Corrosion Science in order to :

- recognize and understand a corrosion case, whatever the industrial field, the environment and the material,
- be able to propose an efficient remedy,
- participate [with designing people] to the best choice for a new plant or for a new industrial or domestic structure.

CONTENT

- Oxidation and dry corrosion : thermodynamic and kinetic aspects, high temperature oxidation of alloys, protection concepts, effects of S, C....
- Electrochemistry and corrosion: thermodynamic and kinetic aspects; polarization diagrams, passivity of alloys...
- Corrosion protection: cathodic protection, anodic passivation, coatings, inhibitors.
- Industrial aspects of corrosion: corrosion modes, economical aspect.

BIBLIOGRAPHY

- [1] D.LANDOLT, Corrosion et Chimie des Surfaces de métaux. Presses Polytechniques et Universitaires Romandes 1993
- [2] M.G FONTANA, N.D GREENE, Corrosion Engineering, Mc Graw Hill 1967
- [3] H.H UHLIG and R.W REVIE - Corrosion and Corrosion Control, J.Wiley and Sons 1985
- [4] S. AUDISIO - le livre Multimédia de la corrosion, IIème édition, INSA Lyon, Laboratoire de Physico-Chimie Industrielle
- [5] B. NORMAND, N. PEBERE, C. RICHARD, M. WERY : Prévention et lutte contre la corrosion : Une approche scientifique et technique, Pub. By PPUR coll. INSA de Lyon, 2004

PRE-REQUISITE

Basic metallurgical and physicochemical knowledge