

IDENTIFICATION

Course code : E1CP2PC4
ECTS : 2

DURATION

Lectures : 10
Tutorial classes : 12
Labs : 8
Total : 30

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

Materials available on the Moodle platform.

LANGUAGE

English

CONTACT

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UE : PHYSIQUE-CHIMIE

COURSE : Chemical Equilibria II

SCOPE OF THE COURSE

OBJECTIVES

Redox reactions involving metals : under what conditions can a metal oxidize ? How to protect it from corrosion ? How to detect the presence of metals in solution ?

COMPETENCE AND SKILLS

- Know how to write the formation reaction of a metal oxide with a coefficient of -1 for dioxygen
- Know how to state Ellingham's hypothesis
- Know how to express the standard Gibbs free energy of reaction under Ellingham's hypothesis
- Know how to plot an Ellingham diagram
- Know how to interpret a change in slope in the Ellingham diagram
- Know how to derive the equation of the Ellingham line after a phase change
- Know how to identify the stability domains of the metal and the oxide
- Know how to relate the rate of a redox reaction to electric current
- Know how to justify the need for a three-electrode setup
- Know how to define the term overpotential
- Know how to use a current-potential curve to predict a reaction
- Know how to use a current-potential curve to propose a metal protection solution
- Know how to use a current-potential curve in the context of a titration at imposed current
- Know how to define the corrosion pressure
- Know how to calculate the corrosion pressure
- Know how to graphically determine the corrosion pressure
- Know how to define the corrosion temperature
- Know how to calculate the corrosion temperature
- Know how to graphically determine the corrosion temperature
- Know how to superimpose two Ellingham diagrams to predict the reaction between an oxide and a metal

PROGRAM

1. Oxidation in contact with air
2. Oxidation in aqueous medium
3. Selective precipitation and complexation of metal cations

BIBLIOGRAPHY

REQUIREMENTS