



COURSE DATASHEET

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| Semester: | 2015/16/2 |
| Course: | Corrosion Basics |
| Code: | VEMKFKB211K |
| Responsible department: | Department of Physical Chemistry |
| Department code: | MKFK |
| Responsible instructor: | dr. Tamás Kristóf |

Course objectives:

Basic knowledge of thermodynamics and kinetics of corrosion and of corrosion protection.

Course content:

General overview of corrosion. History. The influence of various factors on the initiation and advancement of corrosion. Economic impact of corrosion. Classification and characterisation of corrosion processes. The role of media, kinetic and mechanism. Metal and solution characteristics important to corrosion. Forms of corrosion. Recognition and prevention. Opportunities in corrosion control. Chemical corrosion. Atmospheric corrosion. High-temperature corrosion, including air and flue gases. Electrochemical corrosion. Definitions. Cathodic and anodic processes. Galvanic corrosion. Galvanic series. Factors influencing galvanic corrosion behaviour. Intergranular attack. Dealloying. Oxygen concentration cell. Mechanical aspects. Stress corrosion. Erosion corrosion, cavitation. Hydrogen embrittlement. Thermodynamics of corrosion. Heterogeneous equilibria in electrochemical systems. Potential – pH diagrams. The potential – pH diagrams of iron, copper and aluminum. Biologically influenced corrosion. Corrosion of plastics and concrete. Design of active and passive corrosion control. Corrosion problems of municipal water and cooling water systems. Corrosion of boilers and heating systems. Corrosion by water and steam. Underground/soil corrosion. Inorganic coatings. Organic coatings. Paint-coats. Inhibitors: theoretical background and mechanism of inhibition. Kinetic effects. Wagner-Traud mechanism. Corrosion of metals in active and passive state.

Requirements, evaluation and grading:

Written exam.

Required and recommended readings:

Salamon Tamás: Korróziós alapismeretek. Veszprémi Egyetemi Kiadó, 2002.