UNIVERSITY OF PANNONIA

SUBJECT DATASHEET

Semester:	2011/12/1
Subject:	Silicate Chemistry I.
Code:	VEMKSIB145K
Responsible department:	Institute of Materials Engineering
Responsible department code:	MKSI
Responsible lecturer:	dr. Margit Enisznè Bódogh

Educational objectives:

Introduction the theory of the most important chemical and physical processes taking place in silicate technologies; attaining of the necessary empirical materials knowledge.

Detailed content of the subject:

The area of silicate chemistry, history of ceramic, glass and cement industry, characterization of ionic crystal structures Correlation between the main physical properties and the crystal structure Structure of silicates, model representations of silicate structures Classification of silicates, correlation between the structure and physical properties of silicates, clay minerals Classification and types of rocks, origin and main minerals of igneous, sedimentary and metamorphic rocks, characterization of raw materials often used in silicate industry, preparing and enrichment of raw materials Colloidal state, preparing of colloidal systems, characteristics of colloidal disperse systems, main disperse systems in silicate industry Solid state reactions, determination of the direction of solid state reactions founded on thermodynamic consideration Calculation of mineral composition of raw materials Phase diagrams of the one-component systems, Fenner-diagram Phase diagrams of the binary systems, congruent and incongruent melting compounds, determination of quantitative phase composition Formation and decomposition of compounds in solid state, binary systems with polymorphic phase transformations, phase separation of melts, solid solutions, important binary systems in silicate industry Phase diagrams of ternary systems, eutectic system, ternary systems with congruent or/and incongruent melting binary and ternary compounds Determination of quantitative phase composition in ternary systems Interpretation of ternary phase diagrams of practical importance, industrial products of the different systems Characterization of glassy state, structure and properties of glasses, theories of glass structure, correlation between the structure and properties of glasses X-ray diffraction phase analysis of silicate materials, processes taking place in silicate products during the heat treatment, thermogravimetry and differential thermal analysis

Requirements:

Compulsory attendance of the lectures, passing two midterm tests with a score of 2 or above, grading is based on oral examination

Required and suggested references:

Friedrich Liebau: Structural Chemistry of Silicates (Springer-Verlag, Berlin, 1985) W. Hinz: Silikate (VEB

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Verlag für Bauwesen, Berlin) Nemecz E.: Ásványtan (VE jegyzet) Náray-Szabó I.: Kristálykémia (Akadémiai Kiadó, Bp. 1965) Anyagszerkezeti vizsgálatok, laboratóriumi gyakorlatok (VE jegyzet, 1980) Tamás F.: Szilikátipari Kézikönyv (Műszaki Könyvkiadó, Bp. 1982) Tamás F.: Fázisdiagramok anaglif ábrázolása (Műszaki Könyvkiadó, Bp. 1964) Juhász A.Z.: Bevezetés a szilikátkémiai technológiába I. (VE jegyzet, 1985) Tamás F.: Szilikátipari laboratóriumi vizsgálatok (Műszaki Könyvkiadó, Bp. 1970) Déri M. és szerzőtársai: Szilikátkémiai technológia (VE jegyzet)