

SURFACE COATINGS CHEMISTRY

1.1. Identification

University:	Kungl Tekniska Högskolan (KTH), Stockholm, Sweden											
School:	School of Chemical, Science and Technology											
Course:	Surface Coatings Chemistry											
ECTS:	7.5											
Semester:	<i>Winter</i>				<i>Summer</i>				X			
Category	<i>Fundamental course</i>				<i>Specialisation course</i>				X			
Module	<i>MFI</i>		<i>MFII</i>		<i>MFIII</i>		<i>MSI</i>		<i>MSII</i>	X	<i>MSIII</i>	
Teachers:	Anders Hult, Eva Malmström											
Language:	<i>English</i>	X	<i>Italian</i>		<i>Swedish</i>	X	<i>Spanish</i>					

1.2. Learning-outcomes

- Knowledge about basic terms in the field of surface coatings chemistry.
- Knowledge in the characterisation of the uncured coating regarding chemical composition.
- Knowledge in the Evaluation of the properties (adhesion, hardness etc) of the cured film
- Knowledge about the synthesis of a polymer suitable as resin for organic coating

1.3. Competencies

▪ General

- to have critical understanding of technical and scientific tools
- to work and manage teams
- communication skills (both written and oral)
- to work in an international context

▪ Specific

- Knowledge of system for surface treatment regarding the components and their function
- Knowledge of the importance of good wetting and suitable rheological properties for the surface treatment system
- Knowledge of the environmental effect of different surface treatment systems
- Knowledge of film formation in physically and chemically drying systems (oxidative drying, polyester-melamine, epoxy-alcohol, epoxy-amine, isocyanate-alcohol and irradiation curing).

1.4. Contents

Introduction to coating chemistry; Resin chemistry - physically drying resins, chemically drying resins, radiation cured resins, powder coatings; Pigments and other additives; Paint manufacturing; Paint rheology; Application methods; Drying methods and equipment; Coating substrates; Pre-treatment methods; Testing methods (wet and dry paint); Internal and external environment in coating processes.

1.5. Teaching Methodology

- Lecture sessions
- Practical sessions: “cooperative work” for solving problems
- laboratory work

1.6. Evaluation

- written exams
- oral evaluation of the problems solved by “cooperative work”
- oral evaluation of laboratory work

1.7. Bibliography

- High-performance thermosets : chemistry, properties, applications / Shioh-Ching Lin, Eli M. Pearce, : Hanser : Hanser/Gardner, cop. 1994