

PhD course "Colloid Science for the development of cosmetic, pharmaceutical and household products"

SYLLABUS

1 Lecturer information

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2 Title of the course

Colloid Science for the development of cosmetic, pharmaceutical and household products

3 Course program

Solution properties of amphiphilic molecular association contain a variety of structural information like size, shape, size distribution, solubilization states, membrane flexibility and molecular interaction etc. which can be determined by scattering, spectroscopic and microscopy techniques. In particular, Ultra-Small / Small / Wide angle X-ray scattering (U-SAXS, SAXS, WAXS) are the key techniques to capture structural characteristics that can be deduced from the scattering intensity distribution with respect to electron density fluctuations of self-assembled samples. Furthermore, knowledge of the state of existence of a target component dissolved in the molecular associate in solution allows innovative functional properties of products in cosmetics and pharmaceuticals. In this contribution, we describe in detail the usefulness of (mainly) SAXS in material development of molecular associates formed by surfactants and proteins, and the solubilization characteristics of the ingredients in micelle, emulsion, lamellar phases and protein aggregates.

4 Course content detailed per lesson of two hours (possibly with dates and room real and virtual)

Lesson 1 – Lecture: Basic of Surfactant Science 50'+50'

Lesson 2 – Lecture: Application in Cosmetics 50'+50'

Lesson 3 – Lecture: Application in Pharm. & Household 50'+50'

Lesson 4 – Lecture/Demonstration: Cosmetic formulation 50'+50'

5 Suggested reading

T. Cosgrove: "Colloid Science: Principles, Methods and Applications", 2nd Edition, Wiley.

6 Learning Objectives

Providing the students with fundamental knowledge on industrial application for Cosmetics, Pharma., Household.

7 Knowledge and Skills to be acquired

Basic knowledge on colloid science.

8 Prerequisites

None.

9 Teaching Methods

MODE 1 - Pre-recorded lessons uploaded on the moodle platform (a meeting must be organized with PhD students in order to clarify eventual doubts)

MODE 2 (preferred) - Lessons delivered in-person and in remote with simultaneous recording by the WEBEX platform

10 Further information

Slides of the lectures will be provided.

11 Type of Assessment

Written test: written critical discussion (short essay) of a case- study/literature article that involves the techniques explained in the course. Max 5000 words.

The final evaluations will have to be validated maximum 2 months after the end of the course.

12 Period

December Tentative 19-21nd 2023/ 4 slots of 2 hours each.