UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

New Lignin-Based Sustainable Materials: Science and Technological Aspects

2526-1-124R009

Title

New lignin-based sustainable materials: science and technological aspects.

Teacher(s)

Luca Zoia ; Ruggero Barni ; Carmen Canevali

Language

English

Short description

Lignin is the second most abundant organic macromolecule in nature. Its extraction tends to increase worldwide, demanding new applications for an efficient lignin use. This course gives an overview on the whole lignin life cycle, from biosynthesis to industrial applications.

In particular, the following subjects will be developed:

- Chemistry of lignocellulosic materials

- Lignin biosynthesis, chemical structures and reactivity

- Lignin extraction processes (kraft, alkaline, organosolv)

- Main techniques in Lignin characterization (FT-IR, GPC, 31P-NMR, 13C-NMR, 2D-HSQC, EPR, SEM, ICP-AES)

- Plasma technology for lignin modification: plasma treatment aimed to surface functionalization for lignin-based composites

- Sustainability initiative in lignin valorization and lignin bio-based materials (certification of bio-based content by bio-based carbon content based on the European norm EN 16785-1)

Final evaluation: An oral interview on the subjects covered will be used to assess the knowledge imparted during the course

CFU / Hours

1 CFU - 8 Hours (Lecture)

Teaching period

II semester

Sustainable Development Goals

INDUSTRY, INNOVATION AND INFRASTRUCTURE | RESPONSIBLE CONSUMPTION AND PRODUCTION | CLIMATE ACTION