



ARISTOTLE
UNIVERSITY
OF THESSALONIKI

RESEARCH
COMMITTEE

X-RAYS, OPTICAL CHARACTERIZATION & THERMAL ANALYSIS LABORATORY COLLABORATION WITH THE INDUSTRIAL SECTOR

The collaboration of X-Rays, Optical Characterization and Thermal Analysis Laboratory (XOpTh - AUTH), located in the Department of Physics AUTH, with the industrial sector aims to the synthesis and study of innovative and high technology materials that meet the requirements of each application. The subsequent purpose is their commercial use, optimizing their application systems. The cooperating companies and their sectors are:

- 1. INTERPLAST:** Production of plastic pipes and fittings to the very highest specifications, for use in water supply, heating and sewerage systems
- 2. CHIMAR HELLAS:** Industrial research into chemicals and technologies for the resin and composite wood industry
- 3. AGROINVEST:** Activities in the agro-industry, food and bio-energy sector

Application Field

• «RESEARCH – CREATE – INNOVATE»

1. Production of innovative high energy efficiency pipes for underfloor heating and cooling applications
2. Pre-insulated multi-layer pipes of high thermal insulation and dimensional stability, for heating-cooling systems
3. New reinforced bio-polymers with nanocellulose for the production of green wood panels with improved properties

• «Aquaculture - Industrial Materials - Open Innovation in Culture»

1. Development of advanced composite materials for the construction industry using renewable raw materials

Services Offered to Third Parties

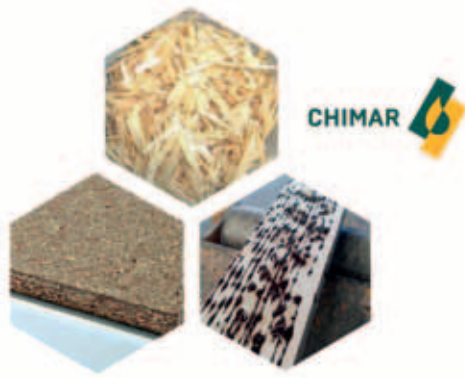
- X-Ray Diffraction Analysis (XRD)
- X-Ray Photoelectron Spectroscopy (XPS)
- Thermogravimetric and Differential Thermal Analysis (TG-DTA)
- Differential Scanning Calorimetry (DSC)
- Fourier Transform Infrared Spectroscopy (FTIR)
- UV-Vis Spectrophotometry
- Scanning Electron Microscopy (SEM-EDS)
- Mechanical properties testings

X Rays, Optical Characterization & Thermal Analysis Laboratory (XOpTh - AUTH)

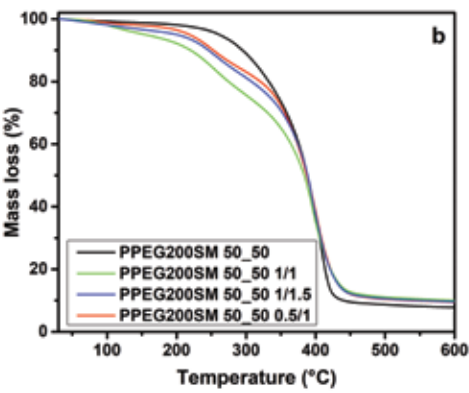
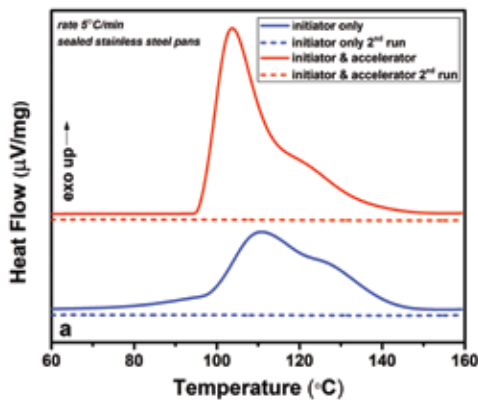
Head of the Laboratory Konstantinos Chrissafis

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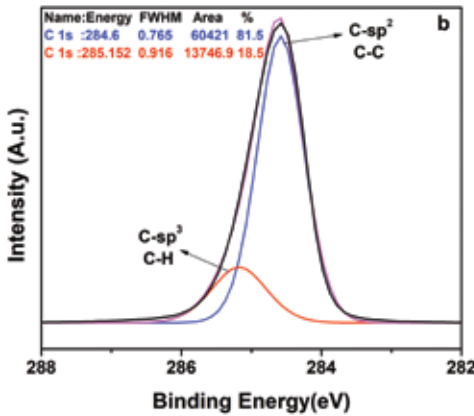
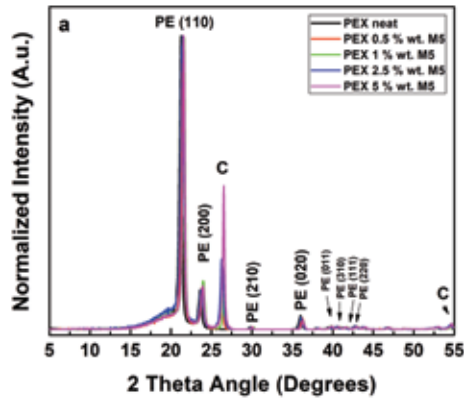
1: CHIMAR provides state-of-the-art binder technology to wood-based panel industries in any part of the world.



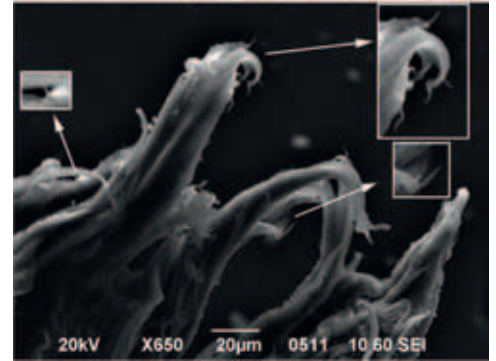
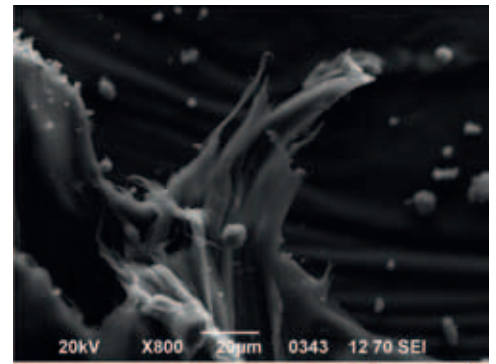
2: DSC (a) and TGA (b) measurements of unsaturated polyester resins derived from a bio-based resource. CHIMAR-X.Op.Th. Laboratory aims to the extensive study and optimization of bio-based materials such as resins with similar or better performance than their petroleum-based counterparts.



3: Interplast manufactures plastic pipes and fittings to the very highest specifications, for use in water supply, heating and sewerage systems and covering a broad range of applications in the areas of house construction, technical projects and industrial facilities.



4: XRD (a) and XPS (b) measurements of polyethylene/graphene nanocomposite for pipe applications. Interplast-X.Op.Th. Laboratory collaboration aims to the extensive study and optimization of the materials, leading to higher performances of the final products.



5: SEM micrographs of the failure surface of polyethylene/graphene nanocomposites, after tensile testing. Fractography analysis is a useful tool to determine the causes of failure and further improve the mechanical properties of the examined materials.

Acknowledgment: These researches have been co-financed by the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE.

