name of the unit:		symbol:
INSTITUTE OF POLYMER AND DYE TECHNOLOGY, Lodz University of Technology		I-33 http://polimbarw.p.lodz.pl
head of the unit:	potential promoters:	contact person:
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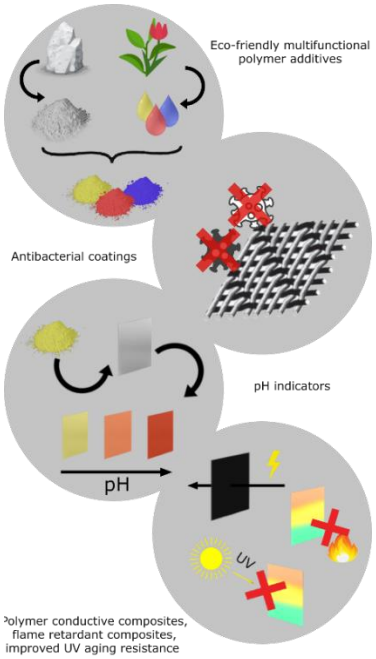
scope of activities:

- ✓ Modification of fillers and biofillers and study of their application potential in polymer materials,
- ✓ fabrication and characterization of hybrid fillers and pigments,
- ✓ natural additives with antibacterial properties,
- ✓ various strategies of improving thermal and chemical stability of natural dyes and their application in polymer composites,
- ✓ „smart" polymer composites (materials showing ability to reversible electrical conductivity and/or color changing upon exposure to different factors such as pH, temperature, light etc.),
- ✓ colorimetric pH indicators,
- ✓ designing and characterization of composites with improved aging resistance, reduced flammability and improved barrier performance,
- ✓ development of novel polymer materials with strictly defined functional properties,
- ✓ synthesis of new, non-migrating colorants for polymers,
- ✓ designing of new specialized coatings for, medical construction and military applications (e.g. antibacterial, antiviral, antifungal, inflammable etc.).

graphic material



present activities:

The research team deals with the broadly understood research topics related to the production, modification and application of polymer additives used in plastics technology. As part of the research, both traditional fillers and substances of natural origin are used. The work is also focused on modern "smart" materials and the study of their response to external factors such as temperature, light or pH. The team's research is also focused on developing new colouring substances with improved physico-chemical properties (increased chemical stability, UV resistance, thermal stability) and polymeric materials with additional functionality (biocidal activity, selective radiation reflection, surfaces with increased hydrophobicity, etc.).

Future activities:

The team's future work assumes the continuation of current research topics and the development of scientific issues related to the use of raw materials of natural origin in order to design new, multifunctional additives for polymers. Planned research also includes the development of medical clothing with antiviral and biostatic properties, as well as specialized textiles for military applications.

Keywords:

Natural additives for polymer materials, colorants, mineral fillers, carbon fillers, anti-aging substances, natural pH indicators, ecological materials with antibacterial and antiviral properties.

List of internship proposal in this research team:

- ✓ Pro-ecological hybrid pigments based on plant extracts and mineral fillers.
- ✓ Development of eco-friendly coatings with antimicrobial and antiviral properties.

List of attachments:

- ✓ Project INKUBATOR 4.0 - *Ecological filter fabrics with antibacterial properties*, Institute of Polymer and Dye Technology, Lodz University of Technology, 01-06.2021.
- ✓ Szadkowski et al. *New natural organic–inorganic pH indicators: Synthesis and characterization of pro-ecological hybrid pigments based on anthraquinone dyes and mineral supports*, J Ind Eng Chem. 105 (2022): 446-462.
- ✓ Marzec et al. *Novel eco-friendly hybrid pigment with improved stability as a multifunctional additive for elastomer composites with reduced flammability and pH sensing properties*, Dyes Pigm. 186 (2021): 108965.