
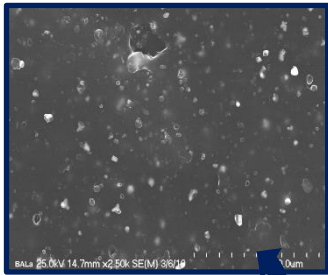
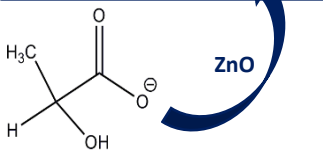




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name of the unit: DIVISION OF NEW VULCANIZING AGENTS AND CROSSLINKING COAGENTS FOR ELASTOMERS Institute of Polymer and Dyes Technology, Lodz University of Technology		symbol: I-33 http://www.polimbarw.p.lodz.pl
head of the unit: Magdalena Maciejewska, PhD, DSc	potential promoters: Magdalena Maciejewska, PhD, DSc Anna Sowińska – Baranowska, DSc	contact person: Magdalena Maciejewska, PhD, DSc, TUL prof. tel: 42-631-32-94 magdalena.maciejewska@p.lodz.pl
scope of activities: The main area of research is the development of new, effective crosslinkers and crosslinking coagents for natural rubber and synthetic elastomers. The scope of research works includes: <ul style="list-style-type: none">• development of new sulfur vulcanization accelerators based on ionic liquids with an appropriately designed structure,• the use of ionic liquids as crosslinking coagents and additives enabling the control of the vulcanization process,• the application of metal complexes as crosslinkers for halogen rubbers using the Heck reaction,• development of pro-ecological vulcanization activators enabling the reduction of the amount of zinc in rubber products,• study of the influence of biofillers on the crosslinking and properties of elastomers.		graphic material  Pro-ecological elastomer composites   Task-specific ionic liquids (TSILs)
present activities: The current activity is focused on the development of an effective method of biofillers modification with ionic liquids with a properly selected structure, in order to improve their interactions with the elastomer matrix, and, consequently, the performance of elastomer composites and their vulcanization parameters. Research is being carried out on both the use of metal complexes and Heck reactions for crosslinking of chloroprene rubber and other halogen rubbers, and on the optimization of the curing system composition in order to ensure safe processing and satisfactory properties of the composites. In addition, alternative components of elastomer composites are being developed to eliminate or to reduce the amount of zinc compounds from rubber composites.		
Future activities: Biosynthesis of zinc oxide with the use of plant extracts and the use of bio-ZnO as a crosslinker and vulcanization activator for elastomer compounds. Modification of biofillers and bio-ZnO with ionic liquids and study of their influence on the crosslinking and properties of elastomer composites.		
Publications/patents, awards, projects: <ul style="list-style-type: none">• Dziemidkiewicz A., Maciejewska M., CR composites with improved processing safety crosslinked via Heck's reaction, Journal of Applied Polymer Science, 2021, 138, e49922, 1-13.• Dziemidkiewicz A., Maciejewska M., Manganese and nickel acetylacetonates as curatives for chloroprene rubber based on Heck's reaction, Materials, 2021, 14, 807.		



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- Sowińska A., Maciejewska M., Grajewska A., Bis(trifluoromethylsulfonyl)imide ionic liquids applied for fine-tuning the cure characteristics and performance of natural rubber composites, *International Journal of Molecular Sciences*, 2021, 22, 3678.
- Maciejewska M., Sowińska A., Influence of fillers and ionic liquids on the crosslinking and performance of natural rubber biocomposites, *Polymers*, 2021, 13, 1656.
- Maciejewska M., Sowińska A., Grocholewicz A., Zinc complexes with 1,3-diketones as activators for sulfur vulcanization of styrene-butadiene elastomer filled with carbon black, *Materials*, 2021, 14, 3804.
- Sowińska-Baranowska A., Maciejewska M., Influence of the silica specific surface area and ionic liquids on the curing characteristics and performance of styrene-butadiene rubber composites, *Materials*, 2021, 14, 5302.
- Maciejewska M., Zaborski M., Elastomer composition from butadiene-acrylonitrile rubber with shortened vulcanization time, intended for the rubber products with improved physical and chemical properties – patent PL224606B1.

Keywords:

crosslinking, vulcanization, crosslinking coagents, crosslinkers, elastomers, ionic liquids, biofillers, zinc oxide

List of internship proposal in this research team:

- Modification of biofillers with ionic liquids and study of their effect on cross-linking and properties of elastomers.