

- tato Starch. *Fibres & Textiles in Eastern Europe* 2010; 18, 5: 24-27.
9. Sutka A, et. al. Nanofibre Electrospinning Poly(vinyl alcohol) and Cellulose Composite Mats Obtained by Use of a Cylindrical Electrode. *Advances in Materials Science and Engineering* 2013, Article ID 932636, DOI: 10.1155/2013/932636.
 10. Sutka A, et. al. Electro-spinning Derived Cellulose-PVA Composite Nano-fibre Mats. *Fibres & Textiles in Eastern Europe* 2014; 22, 3: 43-46.
 11. Brzezinski S, et. al. Antibacterial and Fungicidal Coating of Textile-polymeric Materials Filled with Bioactive Nano-and Submicro-particles. *Fibres & Textiles in Eastern Europe* 2012; 20, 1(90): 70-77.
 12. Šaupert O, Volmajer-Valh J. Viscose Functionalisation with a Combination of Chitosan/BTCA Using microwaves. *Fibres & Textiles in Eastern Europe* 2013; 21, 5: 24-29.
 13. Teterycz H, et. al. Deposition of Zinc Oxide on the Materials Used in Medicine. Preliminary Results. *Fibres & Textiles in Eastern Europe* 2014; 22, 3: 126-132.
 14. Aber SW. *World of Amber* Emporia State University, Kansas, USA. <http://academic.emporia.edu/abersusa/uses.htm>
 15. Patent: PL170450B1, 1993. Masłowski E, et. al. Sposób otrzymywania wyrobów o ujemnym ładunku elektrostatycznym z polimerów syntetycznych i/lub naturalnych.
 16. Patent PL170098B1, 1993. Masłowski E, et. al. Sposób wytwarzania modyfikowanych polimerów syntetycznych i/lub naturalnych.
 17. Okrasa M, Brochocka A, Majchrzycka K. Electret Nonwoven Composites for Filtering Respiratory Protective Equipment, pp. 46-54. In: *Protective and Smart Textiles, Comfort and well-being*. Ed. Frydrych I, Bartkowiak G, Pawłowa M. Ed. Lodz University of Technology.
 18. Brochocka A, et. al. Modified Melt-Blown Nonwovens for Respiratory Protective Devices Against Nanoparticles. *Fibres & Textiles in Eastern Europe* 2013; 21, 4: 106-111.
 19. Majchrzycka K. Evaluation of a New Bioactive Nonwoven Fabric for Respiratory Protection. *Fibres & Textiles in Eastern Europe* 2014; 22, 1: 81-88.
 20. Edwards GF. *Natural Baltic Amber – Magnetic, Adaptogenic, Universally Applicable*. 2010, <http://gailfaithedwards.com>.
 21. Matuszewska A, John A. Some Possibilities of Thin Layer Chromatographic Analysis of the Molecular Phase of Baltic Amber and Other Natural Resins. *Acta Chromatografica* 2004; 14: 82-91.
 22. Nanospider™ electrospinning equipment, <http://www.elmarco.com>



INSTITUTE OF BIOPOLYMERS AND CHEMICAL FIBRES

LABORATORY OF ENVIRONMENTAL PROTECTION

The Laboratory works and specialises in three fundamental fields:

■ **R&D activities:**

- research works on new technology and techniques, particularly environmental protection;
- evaluation and improvement of technology used in domestic mills;
- development of new research and analytical methods;

■ **research services** (measurements and analytical tests) in the field of environmental protection, especially monitoring the emission of pollutants;

■ **seminar and training activity** concerning methods of instrumental analysis, especially the analysis of water and wastewater, chemicals used in paper production, and environmental protection in the paper-making industry.

Since 2004 Laboratory has had the accreditation of the Polish Centre for Accreditation No. AB 551, confirming that the Laboratory meets the requirements of Standard PN-EN ISO/IEC 17025:2005.



AB 388

Investigations in the field of environmental protection technology:

- Research and development of waste water treatment technology, the treatment technology and abatement of gaseous emissions, and the utilisation and reuse of solid waste,
- Monitoring the technological progress of environmentally friendly technology in paper-making and the best available techniques (BAT),
- Working out and adapting analytical methods for testing the content of pollutants and trace concentrations of toxic compounds in waste water, gaseous emissions, solid waste and products of the paper-making industry,
- Monitoring ecological legislation at a domestic and world level, particularly in the European Union.

A list of the analyses most frequently carried out:

- Global water & waste water pollution factors: COD, BOD, TOC, suspended solid (TSS), tot-N, tot-P
- Halogenoorganic compounds (AOX, TOX, TX, EOX, POX)
- Organic sulphur compounds (AOS, TS)
- Resin and chlororesin acids
- Saturated and unsaturated fatty acids
- Phenol and phenolic compounds (guaiacols, catechols, vanillin, veratrols)
- Tetrachlorophenol, Pentachlorophenol (PCP)
- Hexachlorocyclohexane (lindane)
- Aromatic and polyaromatic hydrocarbons
- Benzene, Hexachlorobenzene
- Phthalates
- Carbohydrates
- Glycols
- Polychloro-Biphenyls (PCB)
- Glyoxal
- Tin organic compounds

Contact:

INSTITUTE OF BIOPOLYMERS AND CHEMICAL FIBRES
ul. M. Skłodowskiej-Curie 19/27, 90-570 Łódź, Poland
Małgorzata Michniewicz Ph. D.,
tel. (+48 42) 638 03 31, e-mail: michniewicz@ibwch.lodz.pl