

**ANNUAL REPORT
2000**

DEPARTMENT
OF FIBRES AND TEXTILE CHEMISTRY
SLOVAK UNIVERSITY OF TECHNOLOGY

Faculty of Chemical Technology

Radlinského 9

8 1 2 3 7 BRATISLAVA

Slovak Republic

Telephone: 0421 - 2 - 368 598
Fax: 0421 - 2 - 393 198

DEPARTMENT OF FIBRES AND TEXTILE CHEMISTRY

Head of the Department: Telephone: ++421-7-368 598

Assoc. Prof. Anton Marcinič, PhD Fax: ++421-7-393 198

E-mail: tmarcin@chtf.stuba.sk

I. STAFF

Full Professor:

Eberhard Borsig, DSc;

Associate Professors:

Pavol Hodul, PhD; Krištofič Michal, PhD; Anton Marcinič, PhD;

Assistant Professors:

Jaroslav Legéň, PhD; Anna Ujhelyiová, PhD;

Research Fellows:

Marcela Hricová; Anna Murárová, PhD; Elena Zemanová, PhD;

PhD Students:

Eva Körmenyiová; Zita Mlynarčíková; Silvia Pavlíková;

Technical Staff:

Alžbeta Ferenčáková; Gabriel Kužel; Albína Pokorná; Edita Štábelová;

II. TEACHING AND RESEARCH LABORATORIES

A. Teaching Laboratories:

Laboratory of Macromolecular Chemistry

Laboratory of Computer Modeling of Structure and Properties of Polymers

Laboratory of Textile Auxiliaries

Laboratory of Polymer Fiber and Fibrous Material Structure

DSC, TMA, SALS, Zeta Potential, Surface Properties

Laboratory of Fiber Technology

Laboratory of Textile Chemistry, Bleaching, Dyeing and Finishing

Laboratory of Fiber and Textile Testing

Laboratory for fibre spinning, drawing and texturing, extruders 16 and 30 mm

Laboratory for dyeing and finishing of fibres and textile materials (Ahiba, Pretema, Multicolor)

B. Research Laboratories:

DSC-Perkin Elmer and DTA (Derivatograph Q 1500 D)

TMA-50 M and TA (Thermomechanical measurement)

Gas Chromatography CHROM-5

Instron, model 1112 and Uster for Mechanical Properties

Dynamic Viscoelastomer model Rheo-200

Alambeta for Measurement of Thermo - Properties of Textiles

Integral electrometer Polystat PS-1

Capillary viscosimeter

Computers PC-AT and XT

Unimode semiconductive Laser 25mW 690nm with universal optical set

Microscope Olympus Model BHT

Laboratory equipments for light degradation of fibrous materials Xenotest

III. TEACHING

A. Undergraduate Study

5th Semester (autumn)

Macromolecular Chemistry	(2-0 h)	Borsig
6th Semester (spring)		
Material Technology	(2-0 h)	Marcinčin
Cosmetic and indoor chemistry	(2-0 h)	Hodul
7th Semester (autumn)		
Macromolecular Chemistry II	(2-1 h)	Borsig
Physics of Polymers and Paper	(2-2 h)	Krištofič
Fiber Sci. and Technology	(3-0 h)	Marcinčin
Seminary Fiber Sci. and Technology	(0-2 h)	Marcinčin
Structure of Fibrous Materials	(2-1 h)	Ujhelyiová
Modeling of Polymer Structure and Properties	(2-1 h)	Rýchly
Laboratory of Fiber Sci. and Technology	(0-0-8)	Krištofič Legéň
8th Semester (spring)		
Coloristics and Textile Auxiliaries	(2-0 h)	Hodul
Fibrous Composites	(2-0 h)	Krištofič
Textile Engineering	(2-0 h)	Ujhelyiová Murárová
Seminary Textile Engineering	(0-2 h)	Ujhelyiová Murárová
Laboratory II.	(0-0-10)	Legeň Hodul
Excursion and Technical Experience		Marcinčin Demianová
9th Semester (autumn)		
Textile Chemistry and Technology	(3-1 h)	Hodul
Technology of Polym. Films	(2-0 h)	Marcinčin
Laboratory of Textile Chemistry and Technology	(0-0-10)	Hodul
Fiber and Textile Testing	(2-0 h)	Legéň
10th Semester (spring)		
Seminary	(0-3-0)	
Diploma work	(0-0-27)	
B. PhD study:		
Physics of Polymers		
Macromolecular Chemistry		
Technology of Polymeric Materials		
Organic Chemistry		
Physical Chemistry		
C. An advanced course for Rhodia company employees		
Macromolecular chemistry (20 h)	Borsig, Krištofič	
Chemistry and Technology of Fibres (30 h)	Marcinčin	
Structure and Properties of Fibres (20 h)	Ujhelyiová	
Fibre Testing (20 h)	Legéň	
D. Seminars		

Dispergation mechanism in polymer blends. (Fortelný I., Macromolecular Institute ČAV, Czech Republik)

Hierarchy structure of polymers and mechanical properties. (Raab M., Macromolecular Institute ČAV Czech Republik)

Technology in Search of markets: Airlaid nonwovens for a new millenium. (Pivko I. B., Notabene Associates Inc., USA)

Jet ink pointing. (Hodul P., ChTff, STU Slovakia)

IV. CURRENT RESEARCH PROJECTS

Fiber-forming polypropylene blends with polar polymers (Eberhard Borsig)

The aim of the project is a solution of miscibility of polypropylene PP with polar polymers (PA, PET) and also with other additives with respect to achieve a spinning

of these blends. A polymer blend consisting of PP, branched PE and PET was studied by the DSC method. If PE was present in the blend in a minority amount an increase of amorphous phase and on the contrary an increase of crystallinity position in PP component were observed. The results showed that a partial miscibility of PP and LDPE over melting point was observed. On the other hand an decrease of PET crystallinity portion, which forms a disperse phase, was observed it is proportional to its amount in the blend. These morphological changes influence the sorption of dispersion dyes of the blend fibers.

V. COOPERATION

A. Cooperation in Slovakia:

Research Institute for Man-Made Fibres, Svit

Research Institute of Textile Chemistry, Žilina

Rubber Research Institute, Púchov

Polymer Institute, Slovak Academy of Sciences, Bratislava

Research Institute of Chemical Technology, Bratislava

Slovenský hodváb a.s., Senica

Chemosvit a.s., Svit

Rhodia a.s., Humenné

Merina a.s., Trenčín

Slovnaft a.s., Bratislava

Istrochem a.s., Bratislava

B. International Cooperation:

Institute for Textiles and Man-Made Materials, Rudolstadt, Germany

-Technical Textiles

Chemical Fibre Institute, Lodž, Poland

-Organisation of the 1st Central European Conference

State University of Technology and Design, Sankt Peterburg, Russia

-Special fibres

Technical University, Liberec, Czech Republic

-Exchange of staff member and students

CNR Arco Felice, Naples, Italy

-Modified PP fibres

PCD Polymere Linz, Austria

-Antibacterial treatment

Institute of Polymer Research, Dresden, Germany

-Additives for polymers

University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia

-Cooperation in the CEEPUS project

University of Zagreb, Faculty of Textile Technology, Croatia

-Exchange of students

C. Membership in Domestic Organizations and Societies:

Slovak Chemical Society, Bratislava (E. Borsig, P. Hodul, M. Krištofič, A. Murárová, J. Legéň, E. Zemanová)

Advisory Board of Scientific Journal Autex Res. J. (A. Marcinčin)

Advisory Board of Scientific Journal Vlákna a textil (Fibres and Textiles) (A. Marcinčin, P. Hodul)

Commission of the Grant Agency for Technology of the Ministry of School and Science SR (A. Marcinčin)

D. Membership in International Organizations and Societies:

Association of Universities for Textiles (AUTEX) Belgium (A. Marcinčin)

Committee for Slovak-Polish Conference (A. Marcinčin)

Scientific council TU Liberec (A. Marcinčin)

EPF, European Polymer Federation, (E. Borsig)

Advisory Board of Scientific Journal Chemické listy (Chemical letters) Czech Republic (E. Borsig)

Journal of Macromolecular Science, Pure and Applied Chemistry, USA, (E. Borsig)

E. Tempus Programme: -

F. International Scientific Programmes:

CEEPUS

SI-007 Modelling of credits system in textile high education,

M. Krištofič

Centre for International Academic Cooperation at the University of Maribor, Slovenia

University of Zagreb, Croatia

Technical University of Liberec, Czech Republic

Technical University of Lodz, Poland

Technical University of Budapest, Hungary

Technical College for The Light Industry, Hungary

Since 1996 permanently

G. Visitors from Abroad:

H. Visits of Staff Members and PhD Students to Foreign Institutions:

A.

VI. THESES AND DISSERTATIONS

A. Graduate Theses (MS Degree) for state examinations after five years of study (supervisors are written in brackets):

Blaňarová R.: Evaluation of the unevenness of the geometry and the structure of synthetic fibres. (A. Ujhelyiová)

Bročková L.: Evaluation of deformation properties of fibres by the method of TMA. (E. Zemanová)

Borgul'ová A.: Influence of Geometry of Fibres on Dyeing, (A. Murárová)

Gazdíková I.: Fibre-forming blends of polypropylene-polyethyleneterephthalate. (A. Marcinčin)

Korcová D.: Adsorption of surfactants by fibres. (P. Hodul)

Kuchárová A.: Polymer blends for the preparation of fibres. (J. legěň)

Mlynarčíková Z.: Preparation of polymer blend PP-PA6 for fibres. (E. Borsig)

Pavlátová Z.: Modification of polypropylene fibres. (M. Křištofič)

B.Dissertations (PhD):-

C.Dissertations (DSc):-

D.Habilitation Thesis:-

VII. PUBLICATIONS

A. Journals (*registered in Current Contents)

[1]* Greco R., Iavarone A., Fiedlerová A., Borsig E.: Optical properties of IPN-like networks. II. Polyethylene/poly-(butylmethacrylate -co-methylmethacrylate) copolymer systems. J. M. S.-Pure Appl. Chem A 37, 433-446, (2000)

[2]* Hodul P., Weberová M., Marcinčin A. Jedlovská M.: β -cyclodextrin as additive in crease resistant finishing. Vlákna a textil (Fibres and Textiles) 6 159-161(1999)

[3]* Hodul P.: Zošľachťovanie materiálov z elasthanových vlákien. Finishing of elastan fibre materials (in Slovak).Vlákna a textil (Fibres and Textiles) 7, 21-24 (2000)

[4]* Hodul P.: Efektívnejšie využite reaktívnych farbív. More effective use of reactive dyes (in Slovak).Vlákna a textil (Fibres &Textiles) 7, 209-214 (2000)

[5]* Jambrich M., Murárová A., Džubas F.: Aspects of the development of cellulose fibres.Vlákna a textil (Fibres &Textiles) 7, 200-205 (2000)

[6]* Kettman V., Lokaj J., Krátky Ch., Milata V., Hodul P.: Dimetyl (1-metyl-1,3-benzimidazol-5yl) aminoethylene propanedioate monohydrate. Acta Crys. C 56, 1007-1008(2000)

[7]* Křištofič M., Marcinčin A., Ujhelyiová A.: The DSC study of polyamides and copolyamides. J. of Thermal Analysis and Calorimetry 60, 358-369(2000)

[8]* Křištofič M., Marcinčin A., Ujhelyiová A., Murárová A.: Modification of PA6 fibres with alkaline copolyamides. Chem. Papers 54, 53-58(2000)

[9]* Lazar M., Hrčková Ľ., Borsig E., Marcinčin A., Reichelt N., Rätzsch M.: Course of degradation and Built-Up Reactions Isotactic Polypropylene During Peroxide Decomposition. J. Appl. Polym. Sci 78, 886-893 (2000)

[10]* Lazar M., Hrčková Ľ., Fiedlerová A., Borsig E.: Crosslinking during radical polymerization of dodecyl methacrylate. Macromol. Mater. Eng. 283, 88-89 (2000)

[11]* Pionteck J., Hu j., Pompe G., Albrecht V., Schulze U., Borsig E.: Characterisation of radiation behaviour of polyethylene/polymethacrylates interpenetrating polymer networks. Polymer 41, 7915-7923 (2000)

[12]* Ujhelyiová A., Marcinčin A: Unevenness of geometry and structure of synthetic fibres and methods of their estimation. Vlákna a textil (Fibres ana Textiles) 7,184-188 (2000)

B. Conferences (* International conferences)

[1]* Borsig E., Fiedlerová A., Greco R., Lavarone M., Vogl O., Rhomann R.: IPN-Like System with Thermal Control of its Transparency. In: Proceedings of ACS National

Meeting: Polymeric Materials: Science&Engineering 82, 3219(2000), San Francisco, USA, March 26.-30. 2000, p. 1

[2]* Borsig E., Fiedlerová A., Hrčková L., Lazar M.: Mechanism and Efficiency of Polypropylene Grafting in the solid State. In: Book of Abstracts of the 1st International symposium on "Reactive polymers" in Inhomogeneous Systems, in melts, Dresden, Germany, July 16.-19. 2000, L 22

[3]* Borsig E., Lazar M., Fiedlerová A., Hrčková L., Rätzsch M., Marcinčin A.: Solid state polypropylene grafting as an effective chemical method of modification. In: Proceedings (CD ROM) of the 1st International Modest 2000 Conference, Palermo, September 3.-5. 2000

[4]* Borsig E., Lazar M., Fiedlerová A., Hrčková L.: Grafting of Polypropylene in Solid state - an effective method of chemical modification of polymers. Tagungsband "Polymerwerkstoffe 2000", Halle, Germany, September 25.-27. 2000, p. 139-142

[5]* Borsig E., Fiedlerová A., Greco R., Marcinčin A., Thomann R.: An Interpenetrating Polymer Network Exhibiting Temperature Dependent Transparency. In: Proceedings of World Polymer Congress IUPAC MACRO 2000, 38th Macromolecular IUPAC Symposium, Warsaw, Poland, July 9.-14. 2000

[6]* Danko M., Hrdlovič P., Borsig E.: Spectral Characterisation of transparent IPN systems by fluorescence probes based on pyrene. In: Proceedings of the 14th Bratislava International Conference of Modified Polymers " Property Tailoring of Thermoplastics-Based Blends and Composites", Bratislava, Slovak Republic, October 1.-4. 2000, p. 131-132

[7]* Danko M., Hrdlovič P., Borsig E.: Application of linked Fluorescence probes based of pyrene for spectral characterisation of transparent IPN system [polyethylene/poly(butyl methacrylate-co-styrene)]. In: Book of Abstracts of World Polymer Congress IUPAC MACRO 2000. 38th Macromolecular IUPAC Symposium, Warsaw, Poland, July 9.-14. 2000, p. 840

[8]* Fiedlerová A., Borsig E., Greco R., Iavarone M.: IPN-like Systems with the Thermal Control of its Transparency. In: Proceedings of the 14th Bratislava International Conference of Modified Polymers " Property Tailoring of Thermoplastics-Based Blends and Composites", Bratislava, Slovak Republic, October 1.-4. 2000, p. 139-140

[9]* Fiedlerová A., Greco R., Borsig E.: Vzájomné preniknuté polymérové siete s teplotne regulovateľnou transparentiou. Interpenetrating polymer network with thermal controlled transparency (in Slovak). In: Proceedings of Slovak-Czech Meeting on Polymers, Smolenice, Slovak Republic, October 23.-25. 2000, p.48-50

[10]* Hodul P.: Textilná výroba a trendy v technológii zošľachtovania. Textile industry and development in textile finishing (in Slovak). In: Proceedings of Internationale Conference "Textile in 2000", Žilina, Slovak Republic, April 13.-14. 2000, VIII-1-14

[11]* Hodul P., Weberová M., Marcinčin A., Jedľovská M.: β -cyclodextrin in textile finishing. In: Book of Abstracts of the 1st Central European Conference on Fibre Grade Polymers, Chemical Fibres and Special Textiles. Lodž, Poland, October 3.-4. 2000, A4

[12]* Hrčková L., Lazar M., Borsig E.: Degradation and Build-Up Reaction in I-PP. In: Proceedings of the 14th Bratislava International Conference of Modified Polymers "Property Tailoring of Thermoplastics-Based Blends and Composites", Bratislava, Slovak Republic, October 1.-4. 2000, p. 154-155

- [13] Jambrich M., Sroková I., Murárová A., Revús M.: Rozvoj vlákien pre separačné membránové procesy. Development of fibres for membrane processes (in Slovak). In: Proceedings of the Slovak meeting "Atractive chemical technologies and materials", Púchov, Slovak Republic, July 14. 2000, p. 13-17
- [14]* Krištofič M., Hricová M., Ujhélyiová A.: Modification of PP Fibres with alkaline Copolyamides. In: Proceedings of the 14th Bratislava International Conference of Modified Polymers "Property Tailoring of Thermoplastics-Based Blends and Composites", Bratislava, Slovak Republic, October 1.-4. 2000, p. 96-97
- [15]* Krištofič M.: Blended fibre forming system PA 6/ Copolyamides. In: Book of Abstracts of the 1st Central European Conference on Fibre Grade Polymers, Chemical Fibres and Special Textiles. Lodž, Poland, October 3.-4. 2000,
- [16]* Marcinčin A., Ujhélyiová A., Marcinčinová T.: Fibre-forming Blends of Polypropylene and polyethylene Terephthalate. In: Proceedings (CD ROM) of the 1st International Modest 2000 Conference, Palermo, September 3.-5. 2000
- [17]* Marcinčin A., Brejka O., Zemanová E., Marcinčinová T.: Processing of Colour Concentrates for Polypropylene and Polyethylene Terephthalate Spun dyed Fibres. In: Proceedings of the 8th Internationale Conference of Dyes and Pigments. Colorchem 2000, Pardubice, Špindleruv Mlyn, Czech Republic 2000, p. 28
- [18]* Marcinčin A.. Polypropylene Fibres, Mass Pigmenting and/or Exhaust Dyeing. In: Book of Abstracts of the 1st Central European Conference on Fibre Grade Polymers, Chemical Fibres and Special Textiles. Lodž, Poland, October 3.-4. 2000, B4
- [19]* Murárová A., Hodul P., Jambrich M.: The influence of Geometrie modification of PET fibres on dyeing. In: Book of Abstracts of the 1st Central European Conference on Fibre Grade Polymers, Chemical Fibres and Special Textiles. Lodž, Poland, October 3.-4. 2000, B3
- [20]* Novák I., Borsig E., Hrčková E., Fiedlerová A.: Adhézne vlastnosti polypropylénu očkovaného maleínanhydridom. Adhesive properties of maleinated polypropylene. In: Proceedings of Slovak-Czech Meeting on Polymers, Smolenice, Slovak Republic, October 23.-25. 2000, p. 30
- [21]* Pavlíková S., Reichert P., Mulhaupt R., Borsig E.: Polymérové kompozity plnené anorganickým plnivom. Polymer composites with inorganic fillér. In: Book of Abstracts Student's scientific conference, Faculty of natural science, Bratislava, Slovak Republic, April 11.-12. 2000, p. 111
- [22]* Pavlíková S., Borsig E.: The polypropylene composite containing inorganic fillir. In: Proceedings of the 14th Bratislava International Conference of Modified Polymers "Property Tailoring of Thermoplastics-Based Blends and Composites", Bratislava, Slovak Republic, October 1.-4. 2000, p.154-155
- [23]* Piontek J., Hu J., Schulze U., Borsig E.: Selective degradation of PE/polymethacrylate -IPN: a new approach to porous structure. In: Proceedings (CD ROM) of the 1st International Modest 2000 Conference, Palermo, September 3.-5. 2000

C. Books and Textbooks

D. Patents

E. Research Reports: