

The institution	Name: The Membrane Separation Processes Group
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Contact Person for this Eol	<p>Title: Dr.</p> <p>First name: Jacek</p> <p>Last name: Wiśniewski</p> <p>Department: Faculty of Environmental Engineering, Institute of Environment Protection Engineering</p> <p>E-mail: jacek.wisniewski@pwr.wroc.pl</p> <p>Phone: +48 71 ext. 320 32 25</p> <p>Fax: +48 71 ext. 328 29 80</p>

Is **interested** in the **participation in a project** that will be prepared and submitted in the following **Area** of the **Thematic Priority 6 Environment** from the Specific Work Programme Cooperation:

Specific Programme	Cooperation
Thematic Priority	6 - ENVIRONMENT (INCLUDING CLIMATE CHANGE)
Activity (number & title from the Work Programme)	6.3. ENVIRONMENTAL TECHNOLOGIES
Sub-priority (number & title from the Work Programme)	6.3.1. Environmental Technologies for Observation, Simulation, Prevention, Mitigation, Adaptation, Remediation and Restoration of the natural and man-made environment
Area (number & title from the Work Programme)	6.3.1.1. Water
Call (number & title from the Work Programme)	ENV.2007.3.1.1.1. Innovative technologies and services for sustainable water use in industries
<p>Short description of the organization expertise relevant to the topic (e.g. staff, areas of expertise and research)</p> <p>Wroclaw University of Technology with its 12 faculties is one of the leading educational centres in Poland. Membrane Separation Processes Group is one of the main research groups of the Institute of Environmental Protection Engineering. The Institute was founded in 1972. It currently employs 106 persons, including 17 professors and 50 doctors of the technical sciences. The Institute's primary attention is directed at problems relating to technical environment protection against pollution of air, water and soil. The research conducted constitutes general approaches to pollutant analysis, mutagenesis, carcinogenesis, environmental pollutant transformations and mathematical modelling of unit processes. The main topics of applied research are concentrated on the elaboration of new environmental protection technologies. The Membrane Research Group consists of 5 scientists (all with Ph.D. degree) and one laboratory assistant, and is concerned with pressure driven and electrochemically driven membrane techniques. The studies are oriented on:</p> <ul style="list-style-type: none"> • environmental application of membrane processes (water and wastewater treatment, recovery of high quality water and valuable substances from the rinsing waters), • application of hybrid processes in water and wastewater purification, • desalination and troublesome ions removal before following desalination, • characterization of membranes, • investigation of the effect of various properties of materials (polimeric membranes vs dispersed particles), • determination of operation conditions on efficiency of the process, • membrane fouling. 	
<p>Proposed contribution to the selected Sub-Priority:</p> <p>Application of pressure driven and electrically driven membrane technology for wastewater treatment coming from different industry branches, e.g. metallurgy, textile industry, detergent production, pesticide production, mining waters etc. Water recovery and valuable substances recovery from wastewaters. Implementation of new techniques into industrial wastewater treatments (replacement of conventional treatment processes with membrane technology as well as evaluation of hybrid processes applications). Studies on wastewater management in industry and possibilities of membrane technology application for improvement of effluent treatment (water recycling, energy consumption decrease...). Determination of optimal process parameters.</p> <p>Analytical possibilities: spectrophotometry, HPLC, GCMS, TOC, zetameter, ion-chromatography, AAS</p>	

Participation in relevant projects (e.g. National Projects, FP5, FP6, INTERREG, LIFE, etc.; acronym & title):

Polish Scientific Committee Grants:

- 4 S401 015 07 "Application of hydrophilic ultrafiltration membranes in removal of colour organic pollutants",
- "Application of hybrid membrane processes in removal of natural organic mater"
- 3 T09C 005 19 "Low pressure membrane techniques as a method of pesticides removal from water",
- 7 T0 7G 039 12 "Recover of valuable components from acidic and alkaline solutions using ion-exchange technique",
- 3 T09D 025 26 "Low pressure membrane processes as a technique for anionic surfactant separation",
- 4 T09B 118 24 "Water softening and denitrification in dialytic process".

Relevant Publications (*Authors, title, editor, year*):

Electrochemical membrane processes:

Wiśniewski J., Wiśniewska G.: Assessing the utility of some technological trains for water recovery from acid and metal salt solutions. *Sep. Purif. Technol.* 2001 vol. 22/23 pp. 467-478

Wiśniewski J., Wiśniewska G.: Application of electrodialysis to water and acid recovery. *Environ. Prot. Eng.* 1999 vol. 25 nr 3 s. 145-150

Wiśniewski J., Wiśniewska G.: Water and acid recovery from the rinse after metal etching operations. *Hydrometallurgy* 1999 vol. 53 (2) pp. 105-119

Wiśniewski J., Wiśniewska G.: Acids and iron salts removal from rinsing water after metal etching. *Desalination* 1997 vol. 109 (2) pp. 187-193

Wiśniewski Jacek A, Wiśniewska Grażyna, Winnicki Tomasz: Application of bipolar electrodialysis to the recovery of acids and bases from water solution.

Wiśniewski J., Róžańska A., Winnicki T.: Removal of troublesome anions from water by means of Donnan dialysis, *Desalination* 182 (2005) 339-346

Wiśniewski J.: Electroseparation techniques using membranes, *Pol. J. Chem. Technol.*, 5(2003), 33-39

Wiśniewski J.: Ion exchange by means of Donnan dialysis as a pretreatment process before electrodialysis, *Environ. Prot. Eng.*, Vol. 32 No. 2 (2006) 47-66

Róžańska A., Wiśniewski J.: Brackish water desalination with the combination of Donnan dialysis and electrodialysis, *Desalination* 200 (2006) 615-617

Róžańska A., Wiśniewski J., Winnicki T.: Donnan dialysis with anion-exchange membranes in a water desalination system, *Desalination* 198 (2006) 236-246

Wiśniewski J., Róžańska A.: Donnan dialysis with anion-exchange membranes as a pretreatment step before electrodialytic desalination, *Desalination* 191 (2006) 210-218

Pressure-driven membrane processes:

Kabsch-Korbutowicz M.: Impact of pre-coagulation on ultrafiltration process performance. *Desalination* 2006 vol. 194 iss. 1-3 s. 232-238

Kowalska I., Majewska-Nowak K., Kabsch-Korbutowicz M.: Influence of temperature on anionic surface active agent removal from a water solution by ultrafiltration. *Desalination* 2006 vol. 198 s. 132-139

Kowalska I., Majewska-Nowak K., Kabsch-Korbutowicz M.: Ultrafiltration treatment of detergent solutions. *Desalination* 2006 vol. 200 iss. 1-3 s. 274-276

Majewska-Nowak K., Kowalska I., Kabsch-Korbutowicz M.: Ultrafiltration of aqueous solutions containing a mixture of dye and surfactant. *Desalination* 2006 vol. 198 s. 157-165,

Majewska-Nowak K., Kowalska I., Kabsch-Korbutowicz M.: The effect of surfactants on organic dye separation by ultrafiltration. *Desalination* 2006 vol. 200 iss. 1-3 s. 283-285,

Kabsch-Korbutowicz M.: Removal of natural organic matter from water by in-line coagulation/ultrafiltration process. *Desalination* 2006 vol. 200 iss. 1/3 s. 421-423,

Kowalska I., Majewska-Nowak K., Kabsch-Korbutowicz M.: The influence of complexing agents on anionic surfactant removal from water solutions by ultrafiltration. W: *The impact of membrane technology to human life*, Ed. by M. Bryjak, K. Majewska-Nowak, M. Kabsch-Korbutowicz. Wrocław: Oficyna Wydaw. PWroc. 2006 s. 147-152,

Kabsch-Korbutowicz M.: Application of in-line coagulation/ultrafiltration process in water treatment. *Environ. Prot. Eng.* 2006 vol. 32 nr 2 s. 67-75,

Kabsch-Korbutowicz M., Biłyk A., Molczan M., The effect of feed water pretreatment on ultrafiltration membrane performance, *Polish J. Envir. Stud.* 2006 vol. 15 nr 5 s. 719-725

Kowalska I., Kabsch-Korbutowicz M., Majewska-Nowak K., Pietraszek M., Separation of detergents from industrial effluents using membrane processes, in.: *Environmental Engineering – Pawłowski, Dudzińska, Pawłowski (eds.) 2007* Taylor & Francis Group, London, 79-83

Other relevant information:

Publications - continued:

Kabsch-Korbutowicz M., Majewska-Nowak K.: Removal of atrazine from water by coagulation and adsorption. Environ. Prot. Eng. 2003 vol. 29 (3/4), pp. 15-24

Majewska-Nowak K., Kabsch-Korbutowicz M., Dodż M., Winnicki T.: Pesticides - a serious hazard to the environment in Poland. Environ. Prot. Eng. 2002 vol. 28 (3/4), pp. 83-94

Majewska-Nowak K., Kabsch-Korbutowicz M., Dodż M.: Effects of natural organic matter on atrazine rejection by pressure driven membrane processes. Desalination 2002 vol. 147 (1-3), pp. 281-286

Majewska-Nowak K., Kabsch-Korbutowicz M., Dodż M., Winnicki T.: The influence of organic carbon concentration on atrazine removal by UF membranes. Desalination 2002 vol. 145 (1-3), pp. 117-122.

Majewska-Nowak K., Kabsch-Korbutowicz M., Dodż M.: Removal of pesticides from natural waters. Environ. Prot. Eng. 2001 vol. 27 (2), pp. 55-69

Dodż M., Kabsch-Korbutowicz M., Majewska-Nowak K., Winnicki T.: The influence of complexing agents on pesticide removal from water by membrane processes. In: Fifth International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe. Proceedings. Prague, 12-14 September 2000. Tallahassee

Kowalska I., Kabsch-Korbutowicz M., Majewska-Nowak K., Winnicki T.: Separation of anionic surfactants on ultrafiltration membranes. Desalination 2004 vol. 162 pp. 33-40

Kowalska I., Kabsch-Korbutowicz M., Majewska-Nowak K., Bor F.L.: The separation properties of polyethersulphone and polysulphone ultrafiltration membranes using sodium dodecyl sulphate (SDS) solutions with the addition of sodium sulphate. Environ. Prot. Eng. 2002 vol. 28 (2) pp. 69-76

Majewska-Nowak K., Kabsch-Korbutowicz M.: Application of low-pressure membrane processes to dye effluents treatment. Environ. Prot. Eng. 1999 vol. 25 (3) pp. 139-144

Majewska-Nowak K., Kabsch-Korbutowicz M., Winnicki T.: Salt effect on the dye separation by hydrophilic membranes. Desalination 1996 vol. 108 (1-3) pp. 221-229

Expertise for industry:

- Removal of detergents from industrial wastewater in ultrafiltration process,
- Technological research on water softening,
- Critical review of the technical documentation on repair project of water treatment plant.
- Cataloguing of the discharge of the dangerous substances by industry into waters and sewage system according to the Directive 76/464/EEG and its relative directives.