**Cooperation in research with academia from Qatar**

Host institution: Centre for Energy Research, Hungarian Academy of Sciences

1121 Hungary, Budapest, Konkoly Thege Miklós út 29-33

Antal Tungler, Emeritus Professor

*Possible research topics for cooperation* (Department of Surface Chemistry and Catalysis)

* **Wet oxidation of process wastewaters, catalysis and high energy irradiation assisted methods**
* **Petrochemical utilisation of waste polyolefins**
* **Liquid phase heterogeneous catalytic hydrogenations**

Selected publications:

1. Szabados E, Győrffy N, Tungler A, Balla J, Könczöl L, Asymmetric hydrogenation of prochiral and kinetic resolution of chiral cyclohexanone derivatives with Pd catalysts, REACTION KINETICS MECHANISMS AND CATALYSIS 111:(1) pp. 107-114. (2014)

2. De la Cruz N, Esquius L, Grandjean D, Magnet A, Tungler A, de Alencastro LF, Pulgarin C, Degradation of emergent contaminants by UV, UV/H2O2 and neutral photo-Fenton at pilot scale in a domestic wastewater treatment plant, WATER RESEARCH 47:(15) pp. 5836-5845. (2013)

3. Chamam M, Földváry C M, Hosseini A M, Tungler A, Takács E, Wojnárovits L, Mineralization of aqueous phenolate solutions: A combination of irradiation treatment and wet oxidation, RADIATION PHYSICS AND CHEMISTRY 81:(9) pp. 1484-1488. (2012)

4. Hosseini AM, Tungler A, Schay Z, Szabó S, Kristóf J, Széles É, Szentmiklósi L, Comparison of precious metal oxide/titanium monolith catalysts in wet oxidation of wastewaters, APPLIED CATALYSIS B-ENVIRONMENTAL 127: pp. 99-104. (2012)

5. N Miskolczi, A Angyal, L Bartha, I Valkai, A Tungler, L Nagy, L Vida, G Nagy, Petrochemical feedstocks by mild cracking of polyolefin rich plastic wastes, MOL SCIENTIFIC MAGAZINE 1: pp. 22-28. (2012)

6. Hosseini AM, Tungler A, Schay Z, Szabó S, Kristóf J, Széles É, Szentmiklósi L, Comparison of precious metal oxide/titanium monolith catalysts in wet oxidation of wastewaters, APPLIED CATALYSIS B-ENVIRONMENTAL 127: pp. 99-104. (2012)

7. Hosseini AM, Tungler A, Bakos V, Wet oxidation properties of process waste waters of fine chemical and pharmaceutical origin, REACTION KINETICS MECHANISMS AND CATALYSIS 103:(2) pp. 251-260. (2011)

8. Hosseini AM, Bakos V, Jobbagy A, Tardy G, Mizsey P, Mako M, Tungler A, Co-treatment and utilisation of liquid pharmaceutical wastes, PERIODICA POLYTECHNICA-CHEMICAL ENGINEERING 55:(1) pp. 3-10. (2011)

9. Hosseini AM, Tungler A, Horváth ZE, Schay Z, Széles É, Catalytic wet oxidation of real process wastewaters, PERIODICA POLYTECHNICA-CHEMICAL ENGINEERING 55:(3) pp. 49-57. (2011)

10. Angyal A, Miskolczi N, Bartha L, Tungler A, Nagy L, Vida L, Nagy G, Production of steam cracking feedstocks by mild cracking of plastic wastes, FUEL PROCESSING TECHNOLOGY 91:(11) pp. 1717-1724. (2010)

11. Tungler A, Ódor E, Bajnóczy G, Catalytic Hydrogenation of Azide Ion in Process Waste Waters, TOPICS IN CATALYSIS 53:(15-18) pp. 1153-1155. (2010)

Peter Mizsey Professor, BME Budapest University of Technology and Economics, Department of Chemical and Environmental Process Engineering

* **Water and wastewater treatment with membrane unit operations**

The different membrane unit operations are capable for water and wastewater treatment. Especially the membrane filtration can be applied to remove the dissolved salts and materials from the water, like see water, and also to remove such materials from wastewater. Such a wastewater treatment offers the possibility for water reuse (permeate) and concentration of the pollutions (retentate). The membrane unit operations can be: micro-, ultra-, nanofiltration, and reverse osmosis depending on the size of the material to be removed from the water. We have completed designs.

Organophilic pervaporation can be also considered for the removal of dissolved organic volatile compounds from an aqueous solution. We have computer model for pervaporation, too.

Selected publications (lectures, proceedings are omitted):

1. Andras Jozsef, Toth, Peter Mizsey, Methanol removal from aqueous mixture with organophilic pervaporation: experiments and modelling, accepted for publication in *Chemical Engineering Research and Design* (2015)
2. Csilla Maria Tonko, Andras Kiraly, Peter Mizsey, Gyorgy Patzay, Edit Csefalvay, Limitation of hardness from thermal water by means of nanofiltration, *Water Science & Technology*, 67/9 (2013), pp. 2025-2032 (IF: 2011, 1.122)
3. Nóra Valentinyi, Edit Cséfalvay, Peter Mizsey, Modelling of pervaporation: parameter estimation and model development, *Chemical Engineering Research and Design*, 2013, Pages 174–183, (IF – 5 year – 2.028) <http://dx.doi.org/10.1016/j.cherd.2012.07.001>
4. Viktor Pauer, Edit Csefalvay, Peter Mizsey, Treatment of soy bean process water using hybrid processes*, Central European Journal of Chemistry*, ISSN: 1895-1066 (print version), ISSN: 1644-3624 (electronic version), 11/1 (2013) pp. 46-56 (IF 2011: 1,073)
5. Valentinyi, N., Mizsey. P, Comparison of pervaporation models in flowsheeting environment, *Procedia Engineering* 44 (2012 ) 2098 – 2101
6. Edit Csefalvay, Viktor Pauer, Peter Mizsey, Separation of Bio-Raw Materials, published in *Studia Universitatis Babes-Bolyai, SeriaChemia Journal* (2012) (IF=0.231)
7. András József Tóth, Felicián Gergely, Péter Mizsey, Physicochemical treatment of pharmaceutical process wastewater: distillation and membrane processes, *Periodica Polytechnica*, 55/2 (2011), 1-8 (IF= 0,042)
8. Edit Cséfalvay, Viktor Pauer, Peter Mizsey, [Recovery of copper from process waters by nanofiltration and reverse osmosis](http://www.sciencedirect.om.hu/science?_ob=ArticleURL&_udi=B6TFX-4VVXG7V-R&_user=5674272&_coverDate=05%2F15%2F2009&_alid=895680852&_rdoc=1&_fmt=high&_orig=search&_cdi=5238&_sort=d&_st=4&_docanchor=&_ct=2&_acct=C000016619&_version=1&_urlVersion=0&_userid=5674272&md5=3fa6e11f21e2491ef0555775868d66d7), *Desalination*, Volume 240, Issues 1-3, 15 May 2009, Pages 132-142 (IF=1,851)
9. Anett Lovasz, Tivadar Farkas, Peter Mizsey [Methodology for modelling of pervaporation: step from binary to ternary mixtures](http://www.sciencedirect.om.hu/science?_ob=ArticleURL&_udi=B6TFX-4VW50SH-11&_user=5674272&_coverDate=05%2F31%2F2009&_alid=895675282&_rdoc=1&_fmt=high&_orig=search&_cdi=5238&_sort=d&_st=4&_docanchor=&_ct=2&_acct=C000016619&_version=1&_urlVersion=0&_userid=5674272&md5=75f89b24e6d49deb5a0c3ffeb7060ab8), *Desalination*, Volume 241, Issues 1-3, 31 May 2009, Pages 188-196 (IF=1,899)
10. Edit Cséfalvay, Péter M. Imre, Péter Mizsey, Applicability of Nanofiltration and Reverse Osmosis for the Treatment of Wastewater of Different Origin, *Cent. Eur. J. Chem*. 6(2) 2008 277–283 (IF=0.75)
11. E. Cséfalvay, Z. Szitkai, P. Mizsey, Z. Fonyó, Experimental Data Based Modelling and Simulation of Isopropanol Dehydration by Pervaporation, *Desalination* 229 (2008) 94-108. (IF=1,899)
12. Edit Cséfalvay, Tobias Nöthe, Peter Mizsey Modelling of wastewater ozonation - Determination of reaction kinetic constants and effect of temperature, *Periodica Polytechnica Chemical Engineering* 51/2 (2007) pp. 13-17, ISSN 0324-585