

Dr. ANA INÉS TORRES RIPPA

Department of Chemical Engineering
Universidad de la República Oriental del Uruguay
J. Herrera y Reissig 565, Montevideo, Uruguay

Phone: (598) 2-711-4478 ext. 102
Fax: (598) 2-710-7437
Email: aitorres@fing.edu.uy

EDUCATION

Postdoctoral Training, Chemical Engineering <i>Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A.</i>	2014
Ph.D., Chemical Engineering <i>University of Minnesota- Twin Cities, Minneapolis, Minnesota, U.S.A.</i>	2013
Chemical Engineer <i>Universidad de la República Oriental del Uruguay, Montevideo, Uruguay</i>	2005
BSc. in Chemistry <i>Universidad de la República Oriental del Uruguay, Montevideo, Uruguay</i>	2003

EXPERIENCE

Assistant Professor <i>Department of Chemical Engineering Universidad de la República, Montevideo, Uruguay</i>	2015- Present
External Consultant Project: Biorefinery-Integrated Sustainable Processes for Biomass Conversion to Biomaterials, Biofuels and Fertilizer. Flagship project Masdar Institute (U.A.E.)-MIT. <i>Massachusetts Institute of Technology</i>	2015-Present
Postdoctoral Research Associate <i>Department of Chemical Engineering Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A.</i> Advisor: Prof. G. Stephanopoulos Project: Biorefinery-Integrated Sustainable Processes for Biomass Conversion to Biomaterials, Biofuels and Fertilizer. Flagship project Masdar Institute (U.A.E.)-MIT.	2013-2014
Graduate Research Assistant <i>Department of Chemical Engineering and Materials Science University of Minnesota, Minneapolis, Minnesota</i> Advisors: Profs. P. Daoutidis and M. Tsapatsis Thesis: Biomass to chemicals: design and optimization of processes for the production of 5-Hydroxymethylfurfural (HMF).	2007 - 2013
Research and Development Engineer <i>Fanacif S.A. (Affinia Group Inc.), Montevideo, Uruguay</i>	2005 - 2006

Technical Assistant <i>American Chemical i.c.s.a, Montevideo, Uruguay</i>	2004
Research Assistant <i>School of Chemistry, Department of Food Science and Technology</i> <i>Universidad de la República Oriental del Uruguay, Montevideo, Uruguay</i> Advisor: Prof. I. Jachmanián	2003 - 2005
Teaching Assistant <i>School of Chemistry, Department of Physical Chemistry</i> <i>Universidad de la República Oriental del Uruguay, Montevideo, Uruguay</i>	2001 - 2003

AWARDS

- **Doctoral Dissertation Fellowship** 2011 - 2012
University of Minnesota, Minneapolis, Minnesota.
- **Student Poster Award** 2013
Gordon Research Conference (Nanoporous Materials & Their Applications).

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Reviewer for American Institute of Chemical Engineers Journal 2013 - Present
- Reviewer for RSC's Journal Energy & Environmental Science 2011 - Present
- Member of the American Institute of Chemical Engineers 2008 - Present

PUBLICATIONS

1. **A. I. Torres**¹, M. T. Ashraf², T. Chaturvedi³, J. E. Schmidt⁴, G. Stephanopoulos⁵, "Hydrothermal Pretreatment: Process Modeling and Economic Assessment within the Framework of Biorefinery Processes", submitted to *Hydrothermal Processing in Biorefineries - Production of Bioethanol and High Added-Value Compounds of Second and Third Generation Biomass*, H.A. Ruiz, H.L. Trajano and M.H. Thomsen, Eds. 2017.
2. **A.I. Torres**, G. Stephanopoulos, "Design of Multi-Actor Distributed Processing Systems: A Game-Theoretical approach", *AIChE Journal*, 62 (9), 3369-3391, 2016.
3. Dieste, A., Clavijo, L., **Torres, A. I.**, Barbe, S., Oyarbide, I., Bruno, L., Cassella, F., "Lignin from Eucalyptus spp. Kraft Black Liquor as Biofuel", *Energy & Fuels*, aceptado, 2016. DOI: 10.1021/acs.energyfuels.6b02086
4. M.T. Ashraf, **A.I. Torres**, I. Cybulska, C. Fang, M. H. Thomsen, J. E. Schmidt, G. Stephanopoulos, Optimization of Lignocellulosic Waste Biorefinery using Multi-Actor Multi-Objective Mathematical Framework . *Comput. Aided Chem. Eng.*, 38, 1317-1322, 2016.
5. **A.I. Torres**, T. Bochenski, J.E. Schmidt, G. Stephanopoulos, Economically optimal multi-actor processing networks: material flows and price assignment of the intermediates using Lagrangian decomposition, *Comput. Aided Chem. Eng.*, 38, 1383-1388, 2016.

6. T. Bocheński *, **A.I. Torres** *, M.T. Ashraf, J.E. Schmidt, G. Stephanopoulos, Evaluation of the production of lipids for fuels and proteins from microalgae using a two-level Lagrangian decomposition, *Comput. Aided Chem. Eng.*, 38, 1635-1640, 2016. (*) Denotes equal contribution
7. **Torres, A. I.**, Cybulska, I., Fang, C.J., Thomsen, M. H., Schmidt, J. E., Stephanopoulos, G. "A novel approach for the identification of economic opportunities within the framework of a biorefinery", *Comput. Aided Chem. Eng.*, 37, 1175-1180, 2015.
8. Bonk, F., Chaturvedi, T., **Torres, A. I.**, Schmidt, J. E., Thomsen, M. H., Stephanopoulos, G., "Exploring opportunities for the production of chemicals from municipal solid wastes within the framework of a biorefinery", *Comput. Aided Chem. Eng.*, 37, 2123-2128, 2015.
9. Al-Wahedi, Y., **Torres, A. I.**, Al-Hashimi, S., Dowling, N., Daoutidis, P., Tsapatsis, M., "Economic assessment of temperature swing adsorption systems as Claus tail gas clean up units" *Chem. Eng. Sci.*, 2014. In press.
10. Rajabbeigi, N.*, **Torres, A. I.***, Lew, C. M., Elyassi, B., Ren, L., Wang, Z., Cho, H. J., Fan, W., Daoutidis, P., Tsapatsis, M. "On the kinetics of the isomerization of glucose to fructose using Sn-Beta ", *Chem. Eng. Sci.*, 116, 235-242, 2014.
11. Daoutidis, P., Kelloway, A., Marvin, W. A., Rangarajan, S., **Torres, A. I.**, " Process systems engineering for biorefineries: new research vistas ", *Curr. Op. Chem. Eng.*, 2(5), 442-447, 2013.
12. Daoutidis, P., Marvin, W. A., Rangarajan, S., **Torres, A. I.**, " Engineering Biomass Conversion Processes: A Systems Perspective ", *AIChE J.*, 59(1), 3-18, 2013. (Cover article)
13. **Torres, A. I.**, Tsapatsis, M., Daoutidis, P., "Biomass to chemicals: Design of an extractive-reaction process for the production of 5-hydroxymethylfurfural", *Comput. Chem. Eng.*, 42, 130-137, 2012.
14. Daoutidis, P., Marvin, W. A., Rangarajan, S., **Torres, A. I.**, "Process Engineering of Biorefineries: Recent Results and New Research Vistas", *Proceedings FOCAPO 2012 / CPC VIII*, Foundations of Computer-Aided Process Operations - Chemical Process Control Engineering Conferences, Savannah, GA, 2012.
15. Jogwar, S. S., **Torres, A. I.**, Daoutidis, P., "Networks with Large Solvent Recycle: Dynamics, Hierarchical Control and a Biorefinery Application", *AIChE J.*, 58(6), 1764-1777, 2012.
16. **Torres, A. I.**, Daoutidis, P., Tsapatsis, M., " Continuous Production of 5-Hydroxymethylfurfural from Fructose: a Design Case Study", *Energy Environ. Sci.*, 3(10), 1560-1572, 2010.
17. Margenat, L., **Torres, A.** , Moyna, P., Heinzen, H., Gonzalez, G., Jachmanian, I., "Lanoline Purification by Selective Extraction of Pesticides Using Supercritical CO₂", *J. Supercrit. Fluid*, 45(2), 177-180, 2008.
18. Jachmanian, I., Margenat, L., **Torres, A.** , Grompone, M., "Selectivity of Supercritical CO₂ in the Fractionation of Hake Liver Oil Ethyl Esters", *J. Am. Oil Chem. Soc.*, 84(6), 597-601, 2007.

19. Jachmanian, I., Margenat, L., **Torres, A.** , Grompone, M., “Estabilidad Oxidativa y Contenido de Tocoferoles en el Aceite de Canola Extrado con CO₂ Supercrtico”, *Grasas y Aceites (Spain)*, 57(2), 155-159, 2006.

PRESENTATIONS

1. "Design of Multi-Actor Distributed Processing Systems: A Game-Theoretical Approach", Torres, A. I., Stephanopoulos, G., AIChE Annual meeting, San Francisco, CA, (2016).
2. "Economically optimal multi-actor processing networks: material flows and price assignment of the intermediates using Lagrangian decomposition", Torres, A. I., Bochenki, T., Schmidt, J. E., Stephanopoulos, G., 26th European Symposium on Computer-Aided Process Engineering, Portoro, Slovenia (2016), Oral presentation.
3. "Optimization of Lignocellulosic Waste Biorefinery using Multi-Actor Multi-Objective Mathematical Framework", Ashraf, MT, Ana I. Torres, Iwona Cybulska, Chuanji Fang, Mette H. Thomsen, Jens E. Schmidt, George Stephanopoulos, 26th European Symposium on Computer-Aided Process Engineering, Portoro, Slovenia (2016), Oral presentation.
4. "Evaluation of the production of lipids for fuels and proteins from microalgae using a two-level Lagrangian decomposition", Boche?ski, T., Ana I. Torres, M. Tahir Ashraf, Jens E. Schmidt, George Stephanopoulos, 26th European Symposium on Computer-Aided Process Engineering, Portoro, Slovenia (2016), Poster.
5. "A Novel Approach for the Identification of Economic Opportunities within the Framework of a Biorefinery", A. I. Torres, T. Chaturvedi, I. Cybulska, C. Fang, M.H. Thomsen, J. E. Schmidt, G. Stephanopoulos, 25th European Symposium on Computer-Aided Process Engineering, Copenhagen, Denmark, May 31-June 4, 2015.
6. "Exploring opportunities for the production of chemicals form municipal solid wastes within the framework of a biorefinery", F. Bonk, T. Chaturvedi, A. I. Torres, J. E. Schmidt, G. Stephanopoulos, 25th European Symposium on Computer-Aided Process Engineering, Copenhagen, Denmark, May 31-June 4, 2015.
7. "Framework for the design and optimization of biorefinery networks", A. I. Torres, T. Chaturvedi, Z. Al-Husseini, I. Cybulska, M.H. Thomsen, J. E. Schmidt, G. Stephanopoulos, American Institute of Chemical Engineers Annual Meeting, Atlanta, GA, November 16-21, 2014. Oral.
8. "On the kinetics of the Sn-beta catalyzed isomerization of glucose into fructose ", N. Rajabbeigi * , A. I. Torres* , B. Elyassi, C. M. Lew, L. Ren, Z. Wang, W. Fan, P. Daoutidis and M. Tsapatsis , Gordon Research Conference (Nanoporous Materials & Their Applications), Holderness, NH, August 11-16, 2013. Poster.
9. "Design and optimization of processes for the production of 5-hydroxymethylfurfural ", A. I. Torres, P. Daoutidis and M. Tsapatsis, Catalysis Center for Energy Innovation Spring Symposium, Newark, DE, April 29-30, 2012. Poster.
10. "Biomass to Chemicals: Design of an Extractive Reaction Process for the Production of 5-Hydroxymethylfurfural", A. I. Torres, M. Tsapatsis and P. Daoutidis, American Institute of Chemical Engineers Annual Meeting, Minneapolis, MN, October 16-21, 2011. Oral.
11. "Hierarchical Control of Networks Featuring Large Solvent Recycle", S. S. Jogwar, A. I. Torres and P. Daoutidis, American Institute of Chemical Engineers Annual Meeting, Minneapolis, MN, October 16-21, 2011. Oral.

12. "Biomass to Chemicals: Design of an Extractive Reaction Process for the Production of 5-Hydroxymethylfurfural", A. I. Torres, P. Daoutidis and M. Tsapatsis, 21st European Symposium on Computer-Aided Process Engineering, Chalkidiki, Greece, May 29 - June 1, 2011. Oral.
13. "Design and Optimization of a Process for the Production of 5-Hydroxymethylfurfural from Biomass", A. I. Torres, M. Tsapatsis and P. Daoutidis, American Institute of Chemical Engineers Annual Meeting, Nashville, TN, November 8-13, 2009. Oral.