

Curriculum Vitae

Yaşar Demirel

Work: Department of Chemical and Biomolecular Engineering
University of Nebraska Lincoln
207 K Othmer Hall, 820 N 16th Street
Lincoln, NE 68588
E-mail: ydemirel2@unl.edu
Phone: (402) 472-2745
Website: <http://che.unl.edu/faculty/YasarDemirel.shtml>

Home: 2843 O'Malley Dr
Lincoln, NE 68516
ydemirel24@msn.com
Phone: 402 219 3558



Education History

The University of Birmingham, United Kingdom, Ph.D., Chemical Engineering, 1981.

Thesis Topic: Three Phase Distillation Columns Design & Simulation, Advisor: Dr. Colin McDermott
Manchester Institute of Science and Technology (UMIST), United Kingdom, Chemical Engineering, Advanced
Diploma in Chemical Engineering, 1977.

Hacettepe University, Ankara, Turkey, Chemical Engineering, M.Sc., Chemical Engineering, 1975. Thesis Topic:
Absorption characteristics of Sulfur dioxide. Advisor: Dr. Erdogan Alper

Hacettepe University, Ankara, Turkey, Chemical Engineering, B.Sc., Chemical Engineering, 1974.

Employment History

University of Nebraska – Lincoln (UNL), Associate Professor, Department of Chemical and Biomolecular
Engineering, (January 2009 – present)

Senior Lecturer, Department of Chemical and Biomolecular Engineering, (August 2006 – 2009)

Virginia Tech (VT), Blacksburg, Virginia: Visiting Professor, Department of Chemical Engineering (August
2002-2006).

University of Delaware (UDEL), Newark, Delaware: Visiting Scholar, Department of Chemical Engineering
(June 1999-2001).

King Fahd University Petroleum & Minerals (KFUPM), Dhahran, Saudi Arabia: Full Professor, Department of
Chemical Engineering (2000-2001)

Associate Professor, Department of Chemical Engineering (1993-2000)

Çukurova University, Adana, Turkey: Vice Dean, College of Art and Sciences (1991-1993)

Associate Professor, Department of Chemistry (1986-1993)

Assistant Professor, Department of Chemistry (1981-1986)

Books and Book Contributions

1. Demirel, Y. (2016) Energy: Production, Conversion, Storage, Conservation, and Coupling, 2nd ed., Springer, London. ISBN 978-3-319-29650-0 (611 pages)
2. Demirel, Y. (2014) Nonequilibrium Thermodynamics: Transport and Rate Processes in Physical, Chemical and Biological Systems, 3rd ed., Elsevier, Amsterdam. ISBN: 978-0-444-59557-7. (800 pages).
3. Demirel, Y. (2012) Energy: Production, Conversion, Storage, Conservation, and Coupling, Springer, London. ISBN: 978-14471-2371-2. (510 pages)
4. Demirel, Y. (2007) Nonequilibrium Thermodynamics: Transport and Rate Processes in Physical, Chemical and Biological Systems, 2nd ed., Elsevier, Amsterdam. ISBN: 978-0-444-53079-0. (750 pages).
5. Demirel, Y. (2002) Nonequilibrium Thermodynamics: Transport and Rate Processes in Physical and Biological Systems, Elsevier, Amsterdam. ISBN: 0-444-50886-4. (450 pages)
6. Demirel, Y. (2011) "Energy coupling." In Information and Living Systems in Philosophical and Scientific Perspectives, Eds. G. Terzis, R. Arp, MIT Press, Cambridge, 25-53. ISBN: 978-0-262-20174-2.
7. Demirel, Y. (2007) "Heat storage by phase changing materials and thermoeconomics." Thermal Energy Storage for Sustainable Energy Consumption NATO Science Series, 234, 133-151.
8. Demirel, Y. (2016) 'Energy Conservation.' In Comprehensive Energy Systems, I. Dincer (Ed.) Elsevier, Amsterdam.
9. Demirel, Y. (2016) 'Biofuels.' In Comprehensive Energy Systems, I. Dincer (Ed.) Elsevier, Amsterdam.

Peer Reviewed Journal articles

- 10 Matzen, M., Demirel, Y. (2016) Methanol and dimethyl ether from renewable hydrogen and carbon dioxide: Alternative fuels production and life-cycle assessment, *Journal of Cleaner Production*, 139, 1068-1077. <http://dx.doi.org/10.1016/j.jclepro.2016.08.163>
- 11 Alhajji, M., Demirel Y. (2016) ‘Energy intensity and environmental impact metrics of the back-end separation of ethylene plant by thermodynamic analysis.’ *International Journal of Energy and Environmental Engineering*, 7, 45-59. doi: 10.1007/s40095-015-0194-9.
- 12 Matzen, M., Alhajji, M., Demirel, Y. (2015) ‘Technoeconomics and sustainability of renewable methanol and ammonia productions using wind power –based hydrogen.’ *Advanced Chemical Engineering*, 5: 128. doi:10.4172/2090-4568.1000128.
- 13 Matzen, M., Alhajji, M., Demirel, Y. (2015) Chemical storage of wind energy by renewable methanol production: Feasibility analysis using a multi-criteria decision matrix. *Energy*, 93 343-353.
- 14 Alhajji, M., Demirel, Y. (2015) Energy and environmental sustainability assessment of crude oil refinery by thermodynamic analysis. *International Journal of Energy Research*, 39, 1925-1941.
- 15 Demirel, Y. (2015) ‘Sustainability and economic analysis of propylene carbonate and polypropylene carbonate production process using CO₂ and propylene oxide.’ *Chemical Engineering Process Technology*, 6, 236. doi: 10.4172/2157-7048.1000236.
- 16 Demirel, Y., Matzen, M., Winters, C., Gao, X. (2015) “Capturing and using CO₂ as feedstock with chemical-looping and hydrothermal technologies and sustainability metrics.” *International Journal of Energy Research*, 39, 1011-1047.
- 17 Küçük, K., Tevatia, R., Sorgüven, E., Demirel, Y., Özilgen M. (2015) ‘Bioenergetics of growth and lipid production in *Chlamydomonas reinhardtii*.’ *Energy*, 83, 503-510.
- 18 Tevatia, R., Allen, J., Rudrappa, D., White, D., Clemente, T.E., Cerutti, H., Demirel, Y., Blum, P. (2015) “The taurine biosynthetic pathway of microalgae.” *Algal Research*, 9, 21-26.
- 19 Tevatia, R., Demirel, Y., Rudrappa, D., Blum, P. (2015) “Effects of thermodynamically coupled reaction diffusion in microalgae growth and lipid accumulation: Model development and stability analysis.” *Computers & Chemical Engineering*, 75, 28-39.
- 20 Tevatia, R., Allen, J., Blum, P., Demirel, Y., Black P. (2014) “Modeling of rhythmic behavior in neutral lipid production due to continuous supply of limited nitrogen: Mutual growth and lipid accumulation in microalgae.” *Bioresource Technology*, 170, 152-159. .
- 21 Tevatia, R., Demirel, Y., Blum, P. (2014) “Influence of subenvironmental conditions and thermodynamic coupling on a simple reaction-transport process in biochemical systems.” *Industrial Engineering Chemistry Research*, 53, 7637-7647.
- 22 Demirel, Y. (2014) “Information in biological systems and fluctuation theorem.” *Entropy*, 16, 1931-1948.
- 23 Demirel, Y. (2014) “On the measurements of entropy production in living cells under an alternating electric field.” *Cell Biology International*, 9999, 1-3.
- 24 Demirel, Y. (2013) “Sustainable distillation column operations.” *Chemical Engineering and Process Techniques* 1005, 1-15.
- 25 Nguyen, N., Demirel, Y. (2013) “Economic analysis of Biodiesel and glycerol carbonate production plant by glycerolysis.” *Journal of Sustainable Bioenergy Systems* 3, 209-216.
- 26 Demirel, Y. (2013) “Thermodynamics analysis.” *The Arabian Journal for Science and Engineering*, 38, 221-249.
- 27 Tevatia, R., Demirel, Y., Blum, P. (2012) “Kinetic modeling of photoautotrophic growth and neutral lipid accumulation in terms of ammonium concentration in *Chlamydomonas reinhardtii*.” *Bioresource Technology*, 119, 419-424.
- 28 Nguyen, N., Demirel, Y. (2011) “A novel biodiesel and glycerol carbonate production plant.” *International Journal of Chemical Reactor Engineering* 9, 1-25.
- 29 Nguyen, N., Demirel, Y. (2011) “Using thermally coupled reactive distillation columns in biodiesel production.” *Energy* 36, 4838-4847.
- 30 Demirel, Y. (2010) “Nonequilibrium thermodynamics modeling of coupled biochemical cycles in living cells.” *Journal of Non-Newtonian Fluid Mechanics*, 165, 953-972.
- 31 Nguyen, N., Demirel, Y. (2010) “Retrofit of distillation columns in biodiesel production plants.” *Energy* 35, 1625-1632.

- 32 Kumar, A., H., Demirel, Y., Jones, D.D., Hanna, M.A. (2010) "Optimization and economic evaluation of industrial gas production and combined heat and power generation from gasification of corn stover and distillers grains." *Bioresource Technology* 101, 3696-3701.
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- 34 Demirel, Y. (2009) "Thermodynamically coupled heat and mass flows in a reaction-transport system with external resistances." *International Journal of Heat and Mass Transfer*, 52, 2018-2025.
- 35 Demirel, Y. (2008) "Thermodynamically coupled transport in simple catalytic reactions." *International Journal of Chemical Reactor Engineering*, 6, 1-22.
- 36 Demirel, Y. (2008) "Modeling of thermodynamically coupled reaction-transport systems." *Chemical Engineering Journal*, 139, 106-117.
- 37 Demirel, Y., Ozturk, H.H. (2006) "Thermoeconomics of seasonal heat storage system." *International Journal of Energy Research*, 30, 1001-1012.
- 38 Demirel, Y. (2006) "Assessment of thermodynamic performances for distillation columns." *International Journal of Exergy*, 3, 345-361.
- 39 Demirel, Y. (2006) "Retrofit of distillation columns by thermodynamic analysis." *Separation Science and Technology*, 41, 791-817.
- 40 Demirel, Y. (2006) "Non-isothermal reaction diffusion systems with thermodynamically coupled heat and mass transfer." *Chemical Engineering Science*, 61, 3379-3385.
- 41 Gecegormez, H., Demirel, Y. (2005) "Phase stability analysis using interval Newton method with NRTL model." *Fluid Phase Equilibria*, 237, 48-58.
- 42 Demirel, Y. (2005) "Stability of transport and rate processes." *International Journal of Thermodynamics*, 8, 1-14.
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- 44 Demirel, Y. (2004) "Teaching coupled transport and rate processes." *Chemical Engineering Education*, 38, 254-261.
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- 49 Ozturk, H.H., Demirel, Y. (2004) "Exergy-based performance analysis of packed bed solar air heaters." *International Journal of Energy Research*, 28, 423-432.
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- 53 Demirel, Y. (2001) "Thermodynamic analysis of thermomechanical coupling in tangential couette flow of temperature dependent materials." *International Journal of Exergy*, 1, 53-59.
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- 57 Demirel, Y., Abu-Al-Saud₁, B.A., Al-Ali, H.H., Makkawi₁, Y. (1999) "Packing size and shape effects on forced convection in large rectangular packed ducts with asymmetric heating." *International Journal of Heat and Mass Transfer*, 42, 3267-3277.

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- 59 Demirel, Y. (1999) "Irreversibility profiles in a circular couette flow of temperature dependent materials." *International Communication of Heat and Mass Transfer*, 26, 75-83.
- 60 Demirel, Y., Al-Ali, H.H., Abu-Al-Saud, B.A. (1999) "Enhancement of convection heat-transfer in a rectangular duct." *Applied Energy*, 64, 441-451.
- 61 Demirel, Y. (1999) "Estimation of the entropy of vaporization at the normal boiling point for azeotropic mixtures containing water, alcohol or acetic acid." *Thermochimica Acta*, 339, 79-85.
- 62 Bascetincelik, A., Ozturk, H.H., Paksoy, H.O., Demirel, Y. (1999) "Energetic and exergetic efficiency of latent heat storage system for greenhouse heating." *Renewable Energy*, 16, 691-694.
- 63 Demirel, Y. (1998) "Irreversibility distribution for a pure convection case of the smith-hutton problem." *International Communication of Heat and Mass Transfer*, 25, 671-679.
- 64 Makkawi, Y., Demirel, Y., Al-Ali, H.H. (1998) "Numerical analysis of forced convection heat transfer in a rectangular packed duct with asymmetric heating." *Energy Conversion and Management*, 39, 455-463.
- 65 Demirel, Y., Paksoy_{1,2}, H.O. (1997) "Calculations of thermodynamic derivative properties from the NRTL and UNIQUAC models." *Thermochimica Acta*, 303, 129-136.
- 66 Demirel, Y., Al-Ali, H.H. (1997) "Thermodynamic analysis of convective heat transfer in a packed duct with asymmetrical wall temperatures." *International Journal of Heat and Mass Transfer*, 40, 1145-1153.
- 67 Demirel, Y., Al-Ali, H.H., Abu-Al-Saud₁, B.A. (1997) "Entropy generation of convection heat transfer in an asymmetrically heated packed duct." *International Communication of Heat and Mass Transfer*, 24, 381-390.
- 68 Paksoy, H.O., Ornektekin, S., Balci, B., Demirel, Y. (1996) "The performance of UNIFAC and related group contribution models Part I. prediction of infinite dilution activity coefficients." *Thermochimica Acta*, 287, 251-259.
- 69 Ornektekin, S., Paksoy, H.O., Demirel, Y. (1996) "The performance of UNIFAC and related group contribution models Part II. Prediction of henry's law constant." *Thermochimica Acta*, 287, 235-249.
- 70 Demirel, Y., Saxena, S.C. (1996) "Heat transfer through a low pressure gas enclosure as a thermal insulator: design considerations." *International Journal of Energy Research*, 20, 327-338.
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- 72 Demirel, Y. (1995) "Thermodynamic optimization of convective heat transfer in a packed duct." *Energy*, 20, 959-967.
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- 77 Demirel, Y. (1994) "Calculation of excess entropy for binary liquid mixtures by the NRTL and UNIQUAC models." *Industrial Engineering & Chemistry Research*, 33, 2875-2878.
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- 79 Demirel, Y. (1993) "Correlation of heats of mixing of liquid mixtures by the NRTL model." *Thermochimica Acta*, 219, 83-96.
- 80 Demirel, Y., Paksoy, H.O. (1993) "Thermal analysis of heat storage materials." *Thermochimica Acta*, 213, 211-221.
- 81 Demirel, Y., Gecegörmez, H., Paksoy_{1,2}, H. O. (1992) "Correlation of heat of mixing data by the NRTL and UNIQUAC models. 1. Estimation of the model parameters." *Thermochimica Acta*, 194, 329-341.
- 82 Demirel, Y., Paksoy, H.O. (1992) "Calculation of excess heat capacity for liquid mixtures." *Thermochimica Acta*, 198, 329-344.
- 83 Demirel, Y., Paksoy, H.O., Gecegörmez_{1,2}, H. (1992) "Correlation of heats of mixing data by the NRTL and UNIQUAC models. 2. Prediction of the calorimetric properties." *Thermochimica Acta*, 194, 343-359.
- 84 Demirel, Y., Gecegörmez_{1,2}, H. (1991) "Simultaneous representation of excess enthalpy and vapor-liquid equilibrium data by the NRTL and UNIQUAC models." *Fluid Phase Equilibria*, 65, 111-133.

- 85 Demirel, Y., Dayan, A. (1991) "On the performance of original and modified UNIFAC models in vapor-liquid equilibrium predictions." *Turkish Journal of Chemistry*, 15, 115-122.
- 86 Demirel, Y., Geceğörmez^{1,2}, H. (1990) "On the performance of the NRTL and UNIQUAC models with temperature dependent parameters." *Islamabad Journal of Science*, 10, 69-75.
- 87 Demirel, Y. (1990) "Calculation of enthalpy of mixing at infinite dilution by the NRTL and UNIQUAC models with temperature dependent parameters." *Thermochimica Acta*, 170, 197-208.
- 88 Demirel, Y. (1990) "Calculation of infinite dilution activity coefficient by the NRTL and UNIQUAC models." *Canadian Journal of Chemical Engineering*, 68, 697-701.
- 89 Demirel, Y., Geceğörmez^{1,2}, H. (1989) "Simultaneous correlation of excess Gibbs energy and enthalpy of mixing by the UNIQUAC equation, *Canadian Journal of Chemical Engineering*, 67, 455-461.
- 90 Demirel, Y. (1989) "Experimental investigation of heat transfer in a packed duct with unequal wall temperatures." *Experimental Thermal and Fluid Science*, 2, 425-431.
- 91 Öcal, M.E., Demirel, Y., DüNDAR, C., Haktanir, T. (1989) "Investigation of heat insulation concrete including agricultural waste." (in Turkish) *Turkish Journal of Engineering and Environment*, 13, 169-181.
- 92 McDermott, C., Demirel, Y. (1989) "Correlation of solubility data in ternary liquid mixtures." *Reviews in Inorganic Chemistry*, 10, 226-233.
- 93 Demirel, Y., McDermott, C. (1987) "Distillation simulation for partially miscible systems." *Chimica Acta Turcica*, 15, 329-350
- 94 Demirel, Y., Kuş, S. (1987) "Thermal performance study on a solar air heater with packed flow passage." *Energy Conversion and Management*, 27, 317-325.
- 95 Paksoy^{1,2}, H.O., Demirel, Y. (1987) "A study of heat storage in packed beds." (in Turkish) *Turkish Journal of Engineering and Environment*, 11, 303-317.
- 96 Demirel, Y. (1987) "Quasi-steady state analysis of a solar air heater." (in Turkish) *Turkish Journal of Engineering and Environment*, 11, 1-14.
- 97 Demirel, Y. (1986) "Thermal performance study of a solar air heater." (in Turkish) *Turkish Journal of Engineering and Environment*, 10, 267-279.
- 98 Demirel, Y., Başçetinçelik, A. (1986) "Heat storage and regeneration for agricultural buildings." (in Turkish) *Turkish Journal of Engineering and Environment*, 10, 280-288.
- 99 Demirel, Y. (1986) "On the multicomponent diffusion calculations by means of the Maxwell-Stefan equations." *Chimica Acta Turcica*, 14, 114-129.
- 100 Kuş, S., Demirel, Y., Yegingil, I. (1986) "Türkiyede Üretilen Güneş Toplaçlarının Verim Egrileri." (in Turkish) *Kimya Muhendisliği*, 116, 29-34.
- 101 Demirel, Y., Kuş, S. (1985) "Asimetrik ısıtılan bir kanalda konveksiyonla ısı transferinin deneysel incelenmesi." (in Turkish) *Turkish Journal of Engineering and Environment*, 9, 34-40.
- 102 Demirel, Y., McDermott, C. (1984) "Prediction of phase behavior and bubble point of partially miscible systems." *Chimica Acta Turcica*, 12, 173-188.
- 103 Demirel, Y. (1982) "Comparison of New Molecular Models in Fluid Phase Equilibria Predictions." *Chimica Acta Turcica*, 10, 197-206.
- 104 Kuş, S., Demirel, Y. (1982) "Havali güneş toplacı." (in Turkish) *Çukurova Üniversitesi Fen-Edebiyat Fakültesi Yıllığı*, 1-2, 52-61.
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Conference Proceedings: Peer Reviewed Abstract and/or Peer Reviewed Paper

1. Matzen, M, Demirel, Y. (2015) Biomethanol: Life cycle analysis. Nebraska Summer Research Symposium, University of Nebraska Lincoln August 6, 2015.
2. Winters, C., Demirel, Y. (2014) Chemical-looping technologies and hydrothermal processes for capturing and converting carbon dioxide. Nebraska Summer Research Symposium, University of Nebraska Lincoln August 6, 2014.
3. Demirel, Y. (2014) "Capturing and using CO₂ as feedstock for clean chemical processes technologies." TechConnect World 2014 - Nanotech, Microtech, Biotech, Cleantech Joint 2014 Conferences, 4 pages, Washington, DC; June 15-18, 2014.
4. Demirel, Y. (2013) "Capturing and conversion of CO₂ to methanol in a chemical looping packed bed system." Air Quality IX Conference, 6 pages, Arlington, Virginia; October 21-23, 2013.

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6. Demirel, Y. (2013) "Fluctuation theorem, information and biological systems." 12th Joint European Thermodynamic Conference Proceeding, 6 pages, Brescia, Italy; July 1-5, 2013.
7. Nguyen₂, N., Demirel, Y. (2013) "Biodiesel-glycerol carbonate production plant." National Advanced Biofuels Conference and Expo, 4 pages, Omaha, Nebraska; September 10-12, 2013.
8. Tevatia₂, R., Allen, J., Demirel, Y., Black P., Blum, P. (2013) "Mutual growth and triglyceride accumulation through precise nitrogen limitation in microalgae." National Advanced Biofuels Conference and Expo, 4 pages, Omaha, Nebraska; September 10-12, 2013.
9. Tevatia₂, R., Blum, P., Demirel, Y. (2013) "Analysis of taurine biosynthesis in microalgae using LC-MS." American Society for Microbiology, 4 pages, Denver Colorado; May 18-21, 2013.
10. Nguyen₂, N., Demirel, Y. (2012) "Biodiesel-glycerol carbonate production plant by glycerolysis." 2012 National Conference: Science for biomass feedstock production and utilization, New Orleans, LA; October 2-5, 2012.
11. Nguyen₂, N., Demirel, Y. (2012) "Glycerol carbonate production." 2012 National Conference: Science for Biomass Feedstock Production and Utilization, New Orleans, LA; October 2-5 2012.
12. Demirel, Y. (2012) "Exergy analysis of unit operations" Exergy and Its Applications for Better Environment and Sustainability University of Ontario Institute of Technology Oshawa, ON, Canada; April 30 - May 4, 2012.
13. Demirel, Y. (2012) "Chemical exergy" Exergy and Its Applications for Better Environment and Sustainability University of Ontario Institute of Technology Oshawa, ON, Canada; April 30 - May 4, 2012.
14. Demirel, Y. (2012) "Thermoeconomics" Exergy and Its Applications for Better Environment and Sustainability University of Ontario Institute of Technology Oshawa, ON, Canada; April 30 - May 4, 2012.
15. Demirel, Y. (2012) "Equipartition principle" Exergy and Its Applications for Better Environment and Sustainability University of Ontario Institute of Technology Oshawa, ON, Canada; April 30 - May 4, 2012.
16. Nguyen₂, N., Demirel, Y. (2010) "Reactive distillation column for esterification of lauric acid with methanol: Equilibrium versus nonequilibrium approaches." AIChE Annual Meeting, 4 pages, Salt Lake City, UT; November 7-12, 2010.
17. Nguyen₂, N., Sim, J., Demirel, Y. (2010) "Bioethanol dehydration in thermally integrated extractive distillation columns." AIChE's Annual Meeting, 4 pages, Salt Lake City, UT; November 7-12, 2010.
18. Nguyen₂, N., Demirel, Y. (2010) "Carboxylation of glycerol in a biodiesel plant." AIChE's Annual Meeting, 4 pages, Salt Lake City, UT; November 7-12, 2010.
19. Demirel, Y., Noureddini, H. (2010) "Process development for manufacturing propylene carbonate and poly(propylene carbonate) from propylene oxide and carbon dioxide." Frontiers in Biorefining: Biobased Products from Renewable Carbon, 4 pages, St. Simons Island, GA; October 19-22, 2010.
20. Demirel, Y. (2009) "Properties of thermodynamic coupling between chemical and transport processes with external resistances." 17th Syp. Thermophysical Properties, 4 pages, Boulder CO; June 11-15, 2009.
21. Kumar, A., Demirel, Y., Jones, D., Hanna, M. (2009) "Simulation of biomass gasification using Aspen Plus." 2009 Mid-Central ASABE Meeting- Technical Session, 4 pages, Iowa State University, Iowa; April, 23-24, 2009.
22. Demirel, Y. (2008) "Modular teaching and open ended design projects." AIChE's Annual Meeting, 4 pages, Philadelphia, PA; November 16-21, 2008.
23. Demirel, Y. (2008) "Modeling of active transport." AIChE's Annual Meeting, 4 pages, Philadelphia, PA; November 16-21, 2008.
24. Demirel, Y. (2008) "Retrofit of distillation columns in a methanol plant." AIChE's Annual Meeting, 4 pages, Philadelphia, PA; November 16-21, 2008.
25. Demirel, Y. (2005) "Heat storage by phase changing materials and thermoeconomics." Thermal energy storage for sustainable energy consumption (TESSEC), NATO ASI, 12 pages, Çeşme, Izmir Turkey; June 6-17, 2005.
26. Demirel, Y. (2005) "Modular teaching and product design projects in capstone design." ASEE SE Section Annual Conference, 6 pages, University of Tennessee at Chattanooga, TN; April 3-5, 2005.
27. Demirel, Y. (2004) "Use of nonequilibrium thermodynamics in science and engineering." AIChE's Annual Meeting, 4 pages, Austin, TX; November 7-12, 2004.
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31. Demirel, Y. (2004) "Workbook strategy and active learning experience in engineering education." 34th Annual Conference of the International Society for Exploring Teaching and Learning, 12 pages, Baltimore, MD; October 14-16, 2004.
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34. Demirel, Y. (2003) "Thermodynamic analysis of separation processes." Thirteenth Symposium on Separation Science and Technology for Energy Applications, 4 pages, Gatlinburg, TN; October 27-30, 2003.
35. Demirel, Y. (2003) "Nonequilibrium thermodynamics and stability analysis of transport and rate processes." 3rd International Workshop on Nonequilibrium Thermodynamics and Complex Fluids, 6 pages, Princeton, NJ; August 14-17, 2003.
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46. Paksoy_{1,2}, H.O., Demirel, Y. (1994) "Determining thermal properties of hybrid storage materials." Calorstock'94, 6th International Conference on Thermal Energy Storage, 397-402, Espoo, Finland; August 22-25, 1994.
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51. Demirel, Y. (1987) "The impact of computer technology on developments." International Symposium on Transfer of Computer Technology, 123-128, Amman, Jordan; November 23-25, 1987.
52. Demirel, Y., Pakdil, E. (1986) "UNIFAC modelinin kimyasal proses hesaplamalarında kullanılması." (In Turkish) 2. Ulusal Bilgisayar Destekli Tasarım Sempozyumu, Bildiriler Kitabı Editor: B. Kuryel, 112-119, Izmir, Turkey; Nisan 28-30, 1986.
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57. Kuñç, S., Demirel, Y., Uysal, Y., Eker, A. (1983) "Black nickel coated surface for flat-plate solar collector." Proceedings of First Arab International Solar Energy Conference, edited by H.Alawi, A. Al. Jassar, Al. Juwayhel and A. A. M. Sayigh, Pergamon Press, Oxford, 125-128, Kuwait; December 2-8, 1983.

Invited & Keynote Talks

1. Demirel, Y. (2016) "Sustainability assessment of a crude oil refinery by thermodynamic analysis." 8th International Exergy, Energy and Environment Symposium, Antalya, Turkey; May 1-4, 2016.
2. Demirel, Y. (2013) "Biodiesel and glycerol carbonate production." UNL Nebraska Research Fair, November 7, 2013.
3. Demirel, Y. (2013) "Fluctuation theorem, information and biological systems." 12th Joint European Thermodynamic Conference, Brescia, Italy; July 1-5, 2013.
4. Demirel, Y. (2013) "Collaborative carbon capture research." Nebraska Center for Energy Science Research (NCSR), Nebraska Public Power District (NPPD), Lincoln, NE; July 26, 2013.
5. Demirel, Y. (2012) "Exergy analysis of unit operations" Exergy and Its Applications for Better Environment and Sustainability University of Ontario Institute of Technology Oshawa, ON, Canada; April 30 - May 4, 2012.
6. Demirel, Y. (2012) "Chemical exergy" Exergy and Its Applications for Better Environment and Sustainability University of Ontario Institute of Technology Oshawa, ON, Canada; April 30 - May 4, 2012.
7. Demirel, Y. (2012) "Thermoeconomics" Exergy and Its Applications for Better Environment and Sustainability University of Ontario Institute of Technology Oshawa, ON, Canada; April 30 - May 4, 2012.
8. Demirel, Y. (2012) "Equipartition principle" Exergy and Its Applications for Better Environment and Sustainability University of Ontario Institute of Technology Oshawa, ON, Canada; April 30 - May 4, 2012.
9. Demirel, Y. (2012) "Techno-economic analysis of biodiesel production." Algal Research Group, UNL, Lincoln, NE; March, 12, 2012.
10. Demirel, Y. (2011) "Algal Biomass Preparation as Feed Stock." Algal Research Group, UNL, Lincoln, NE; December, 2011.
11. Demirel, Y. (2009) "Non-equilibrium thermodynamics modeling of coupled biochemical cycles in living cells." 5th International Workshop on Non-Equilibrium Thermodynamics and Complex Systems, Cuernavaca, Mexico; August 24-28, 2009.
12. Demirel, Y. (2009) "Energy storage systems." Departments of Computer Science Engineering and Mathematics, UNL, Lincoln, NE; February, 2009.
13. Demirel, Y. (2008) "Modeling rate and transport processes in mitochondria." School of Biological Sciences and Department of Mathematics, UNL, Lincoln, NE; November 6, 2008.
14. Demirel, Y. (2008) "Some research projects: A) modeling coupled transport and rate process, B) Process design and optimization." Research Luncheon Series, Department of Chemical and Biomolecular Engineering, UNL, Lincoln, NE; September 24, 2008.
15. Demirel, Y. (2005) "Heat storage by phase changing materials and thermoeconomics." NATO Summer School on Thermal Energy Storage for Sustainable Energy Consumption, , Izmir, Turkey; June 6-17, 2005.

16. Demirel, Y. (2004) “Modeling transport and rate processes.” University of Tennessee Knoxville, Tennessee; September 22, 2004.
17. Demirel, Y. (2003) “Thermodynamics efficiency in bioenergetics.” Virginia Tech, Blacksburg, Virginia; February 14, 2003.
18. Demirel, Y. (2001) “Transport in composite membranes.” Winona State University, Winona, Minnesota; February 05, 2001.
19. Demirel, Y. (2000) “Vapor-liquid phase equilibria.” Research group of Dr. S. I. Sandler, University of Delaware, Newark, Delaware; August 10, 2000.
20. Demirel, Y. (2000) “Enhancement in convection heat transfer.” West Virginia University Institute and Technology, Charleston, West Virginia; May, 12, 2000.
21. Demirel, Y. (1997) “Thermodynamic optimization of convective heat flow in packed ducts.” Saudi ARAMCO Technical Meeting, Dhahran. S.A.; February 11, 1997.

Research interests

I. Thermodynamics

- Nonequilibrium thermodynamics of coupled transport and rate processes
- Thermodynamic analysis of processes and pinch technology with heat exchanger network systems
- Self-organized dissipative structures
- Information and fluctuation theory

II. Energy Systems

- Biomass extraction and integrated biorefinery to produce biofuel, bioproducts (bio-oil), and power
- Thermodynamic analysis of energy systems – Sustainable energy systems and management
- Chemical-looping combustion and gasification with carbon capture and utilization
- Hydrothermal conversion of CO₂ and biomass into bioproducts

III. Design and Simulation of Chemical Processes

- Techno economic analysis and sustainability assessments of chemical processes-Life cycle assessment
- Sensitivity analysis and optimization-Food-Water-Energy Nexus
- Retrofit of chemical processes for energy saving and process intensification-thermally integrated distillation
- Facilitated transport for separation of olefins and CO₂.