

REFERENCES

- Al-Yaqoobi, A., Hogg, D. and Zimmerman, W. B. (2016) 'Microbubble distillation for ethanol-water separation', *International Journal of Chemical Engineering*, 2016. doi: 10.1155/2016/5210865.
- Ayotte-Sauve, E. and Sorin, M. (2010) 'Energy Requirements of Distillation: Exergy, Pinch Points, and the Reversible Column', *Industrial and Engineering Chemistry Research*, 49, pp. 5439–5449.
- Baeyens, J. *et al.* (2015) 'Challenges and opportunities in improving the production of bio-ethanol', *Progress in Energy and Combustion Science*. Elsevier Ltd, 47, pp. 60–88. doi: 10.1016/j.pecs.2014.10.003.
- Bird, R. B., Stewart, W. E. and Lightfoot, E. N. (2002) 'Diffusivity and the Mechanisms of Mass Transport', in Anderson, W. and Kulek, P. (eds) *Transport Phenomena*. 2nd edn. Massachusetts: John Wiley & Sons, Inc., pp. 513–542.
- Burton, S. J. and Burton, D. (2014) 'Method and Apparatus for Separating Fluid Mixtures'. United States.
- Cai, B. *et al.* (2018) 'Modeling of spray flash evaporation based on droplet analysis', *Applied Thermal Engineering*. Elsevier Ltd, 130, pp. 1044–1051. doi: 10.1016/J.APPLTHERMALENG.2017.11.083.
- Chen, Q. *et al.* (2016) 'Development of a model for spray evaporation based on droplet analysis', *Desalination*, 399, pp. 69–77. doi: 10.1016/j.desal.2016.08.017.
- Cheroennet, N. and Suwanmanee, U. (2017) 'Net Energy Gain and Water Footprint of Corn Ethanol Production in Thailand', *Energy Procedia*. Elsevier B.V., 118, pp. 15–20. doi: 10.1016/j.egypro.2017.07.003.
- Dismore, A. B. (1970) 'Distillation Apparatus with Spray Chamber and Air Circulating Means'. United States.
- Dombek, K. M. and Ingram, L. O. (1987) 'Ethanol Production during Batch Fermentation with *Saccharomyces cerevisiae*: Changes in Glycolytic Enzymes and

Internal pH', *Applied and Environmental Microbiology*, 53(6), pp. 1286–1291.

Kaewkannetra, P. *et al.* (2011) 'Separation of ethanol from ethanol-water mixture and fermented sweet sorghum juice using pervaporation membrane reactor', *Desalination*. Elsevier B.V., 271(1–3), pp. 88–91. doi: 10.1016/j.desal.2010.12.012.

Katzen, R., Madson, P. W. and Moon, G. D. (1999) 'Ethanol distillation: the fundamentals', in *The Alcohol Textbook: A reference for the beverage, fuel and industrial alcohol industries*, pp. 269–288.

Khatiwada, D. and Silveira, S. (2009) 'Net energy balance of molasses based ethanol: The case of Nepal', *Renewable and Sustainable Energy Reviews*, 13(9), pp. 2515–2524. doi: 10.1016/j.rser.2009.06.028.

Kiuchi, T. *et al.* (2016) 'DEVICE FOR PRODUCING ETHANOL AND METHOD FOR PRODUCING ETHANOL'. United States of America.

Liu, C., Bonaccorso, E. and Butt, H. J. (2008) 'Evaporation of sessile water/ethanol drops in a controlled environment', *Physical Chemistry Chemical Physics*, 10(47), pp. 7150–7157. doi: 10.1039/b808258h.

Luo, H., Bildea, C. S. and Kiss, A. A. (2015) 'Novel heat-pump-assisted extractive distillation for bioethanol purification', *Industrial and Engineering Chemistry Research*, 54(7), pp. 2208–2213. doi: 10.1021/ie504459c.

McCabe, W. L., Smith, J. C. and Harriott, P. (2005a) 'Distillation', in Glandt, E. D., Klein, M. T., and Edgar, T. F. (eds) *Unit Operations of Chemical Engineering*. 7th edn. Singapore: McGraw-Hill Education, pp. 663–736.

McCabe, W. L., Smith, J. C. and Harriott, P. (2005b) 'Humidification Operations', in Glandt, E. D., Klein, M. T., and Edgar, T. F. (eds) *Unit Operations of Chemical Engineering*. 7th edn. Singapore: McGraw-Hill Education, pp. 616–642.

Morey, F. C. (1940) 'Thickness of a liquid film adhering to a surface slowly withdrawn from the liquid', *Journal of Research of the National Bureau of Standards*, 25, p. 385. doi: 10.6028/jres.025.022.

Mulder, M. H. V. *et al.* (1983) 'Ethanol-water separation by pervaporation', *Journal of*

Membrane Science, 16(C), pp. 269–284. doi: 10.1016/S0376-7388(00)81315-0.

Nagy, E. *et al.* (2015) ‘Analysis of energy saving by combination of distillation and pervaporation for biofuel production’, *Chemical Engineering and Processing: Process Intensification*, 98, pp. 86–94. doi: 10.1016/j.cep.2015.10.010.

Nguyen, T. L. T., Gheewala, S. H. and Garivait, S. (2008) ‘Full chain energy analysis of fuel ethanol from cane molasses in Thailand’, *Applied Energy*, 85(8), pp. 722–734. doi: 10.1016/j.apenergy.2008.02.002.

O’Hare, K. D., Spedding, P. L. and Grimshaw, J. (1993) ‘Evaporation of the Ethanol and Water Components Comprising a Binary Liquid Mixture’, *Developments in Chemical Engineering and Mineral Processing*, 1(2–3), pp. 118–128. doi: 10.1002/apj.5500010203.

Onuki, S. *et al.* (2008) ‘Ethanol production, purification, and analysis techniques: a review’, *ASABE Annual International Meeting*, 0300(08), p. 11.

Perry, R. H. (1984) ‘Distillation’, in Green, D. W. and Maloney, J. O. (eds) *Perry’s Chemical Engineering Handbook International Edition 1984*. 6th edn. Malaysia: McGraw-Hill, Inc., pp. 1–97.

Pinto, R. T. P., Wolf-Maciel, M. R. and Lintomen, L. (2000) ‘Saline extractive distillation process for ethanol purification’, *Computers and Chemical Engineering*, 24, pp. 1689–1694.

Schill, S. R. (2014) ‘New ethanol distillation technology tests show 75% energy savings By’, *Ethanol Producer Magazine*, November. doi: 10.4103/1119.

Schönfeld, F. *et al.* (2008) ‘Evaporation dynamics of sessile liquid drops in still air with constant contact radius’, *International Journal of Heat and Mass Transfer*, 51(13–14), pp. 3696–3699. doi: 10.1016/j.ijheatmasstransfer.2007.12.027.

Sefiane, K., Tadrist, L. and Douglas, M. (2003) ‘Experimental study of evaporating water-ethanol mixture sessile drop: Influence of concentration’, *International Journal of Heat and Mass Transfer*, 46(23), pp. 4527–4534. doi: 10.1016/S0017-9310(03)00267-9.

Silbey, R. J., Alberty, R. A. and Bawendi, M. G. (2005) 'Phase Equilibrium', in Brennan, D. and McFadden, P. (eds) *Physical Chemistry*. 4th edn. Cambridge, Massachusetts: John Wiley & Sons, Inc., pp. 177–217.

Thomas, K. C. and Ingledew, W. M. (1992) 'Production of 21% (v/v) ethanol by fermentation of very high gravity (VHG) wheat mashes', *Journal of Industrial Microbiology*, 10(1), pp. 61–68. doi: 10.1007/BF01583635.

Treybal, R. E. (1981a) 'Distillation', in *Mass Transfer Operation*. 3rd edn. Singapore: McGraw-Hill, Inc., pp. 342–473.

Treybal, R. E. (1981b) 'Interphase Mass Transfer', in *Mass Transfer Operation*. 3rd edn. Singapore, pp. 104–123.

Treybal, R. E. (1981c) 'Molecular Diffusion in Fluids', in *Mass Transfer Operation*. 3rd edn. Singapore: McGraw-Hill, Inc., pp. 21–44.

Wu, Y., Zhang, X. and Zhang, X. (2016) 'Simplified analysis of heat and mass transfer model in droplet evaporation process', *Applied Thermal Engineering*. Elsevier Ltd, 99, pp. 938–943. doi: 10.1016/j.applthermaleng.2016.01.020.

Zhu, J. Y. and Zhuang, X. S. (2012) 'Conceptual net energy output for biofuel production from lignocellulosic biomass through biorefining', *Progress in Energy and Combustion Science*. Elsevier Ltd, 38(4), pp. 583–598. doi: 10.1016/j.pecs.2012.03.007.

Ziegler, F. (2010) 'The multiple meanings of the Stefan-number (and relatives) in refrigeration', *International Journal of Refrigeration*. Elsevier Ltd and IIR, 33(7), pp. 1343–1349. doi: 10.1016/j.ijrefrig.2010.06.015.