

BAB V

KESIMPULAN DAN SARAN

1.1. Kesimpulan

1. Nilai *reboiler duty* dan laju alir mol *side-draw* yang cocok secara berurutan adalah 1080 kW dan 7 kmol/h
2. Peningkatan *reboiler duty* dan laju alir mol *side-draw* meningkatkan kemurnian ETBE
3. Peningkatan *reboiler duty* dan laju alir mol *side-draw* menurunkan konversi etanol
4. Peningkatan laju alir mol *side-draw* dapat mengurangi kebutuhan *reboiler duty*
5. Nilai *reflux ratio* yang cocok dapat meningkatkan kemurnian ETBE dan mengurangi kebutuhan *reboiler duty*

1.2. Saran

1. Produksi ETBE dapat memanfaatkan model RDWC dengan memerhatikan kemurnian etanol dipasaran

DAFTAR PUSTAKA

- Bumbac, G., Motelica, Plesu, Bozga, Toma, 2006, *Kinetic Studies on The Etherification of Isobutane to Fuel Ether ETBE*, Pres 06, Praha.
- Chaudhuri, U., 2011, *Fundamentals of Petroleum and Petrochemical Engineering*. University of Calcutta India, CRC Press, New York.
- Dejanovic, I., Matijasevic, Lj., dan Olujic, Z., 2010, Dividing wall column- A breakthrough towards sustainable distilling, *Chemical Engineering and Processing*.
- Edgar, T.F., Himmelblau, D.M. dan Lasdon, L.S., 2001, *Optimization of Chemical Process*, edisi 2, McGraw-Hill, New York.
- Efransyah, F.A., Anggoro, R.L., Kuswandi dan Wibawa, G., 2016, Pendirian Pabrik Dietil Karbonat dari CO₂ dan Etanol Melalui Proses Direct Synthesis, *Jurnal Teknik ITS European Technology and Innovation Platform (ETIP) Bioenergy*, 2019, ETBE, <http://www.etipbioenergy.eu/value-chains/products-end-use/products/etbe>, diakses pada Februari 2020.
- Fitriana, 2010, Pengaruh Kenaikan Reflux Ratio Terhadap Kebutuhan Panas Pada Kolom Distilasi Dengan Distributed Control System (DCS), *Undergraduate thesis*, Undip.
- Kaur, 2017, Reducing Energy Requirements for ETBE Synthesis Using Reactive Dividing Wall Distillation Column, *Department of Chemical Engineering*, Thapar University, India.
- Kirk, R.E., dan Othmer, 1966, *Encyclopedia of Chemical Technology* vol.1, edisi 2, John Wiley and Sons Co., New York.
- Kirk, R.E., dan Othmer, 1998, *Encyclopedia of Chemical Technology* vol. 7, edisi 4, John Wiley and Sons Co., New York.
- Kiss, A.A., 2013, *Advanced Distillation Technologies: Design, Control and Applications*, edisi 1, John Wiley & Sons Ltd, UK.
- Kochar, N.K., Marcell RL, 1981, *US Paten No. 4,334,890.*, U.S. Patent and Trademark Office, Washington DC, USA, dalam Mikus V., Ridzonova M., Steltenpohl P, 2013, *Fuel Additive Production: ethyl tert-butyl ether*, Journal Acta Chimica Slovaca.
- Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM) ITB , 2017, Optimalisasi Produk Skala Mini Pilot Senyawa Peningkat Bilangan Oktan Bensin Jenis ETBE, <https://research.lppm.itb.ac.id/2017/07/04/optimalisasi-produk-skala-mini-pilot-senyawa-peningkat-bilangan-oktan-bensin-jenis-etbe-etil-tersier-butil-eter-melalui-pemanfaatan-crude-c-4-dari-industri-petrokimia-di-indonesia/>, diakses pada Februari 2020.
- Luyben, W. L., Yu, C.C., 2008, *Reactive Distillation Design and Control*, Wiley, pp. 42.
- Mueller, I. dan Kenig, E.Y., 2007, Reactive Distillation in a Dividing Wall Column: Rate-Based Modelling and Simulation, *Ind. Eng. Chem*, 46.

Ortega, E., 2019, What is Aspen Plus?,
https://www.researchgate.net/publication/335568355_What_is_Aspen_Plus, diakses pada Mei 2020.

Overney, R., 2004, Aspen Tutorial #6: Aspen Distillation, University of Washington,
https://courses.washington.edu/overney/Aspen/Aspen_Tutorial_Unit_6.pdf, diakses pada Mei 2020.

Pucci A, Mikitenko P, Zuliani M, 1992, *U.S. Patent No. 5,348,624.*, U.S. Patent and Trademark Office, Washington DC, USA, dalam Mikus V., Ridzonova M., Steltenpohl P., 2013, *Fuel Additive Production: ethyl – t – butyl ether*, Journal Acta Chimica Slovaca.

Smith, R., 2005, *Chemical Process Design and Integration*, edisi 1, John Wiley & Sons, Chichester.

Tung, S.T. dan Yu, C.C., 2007, Effects of Relative Volatility Ranking to the Design of Reactive Distillation, *Chemical Engineering Science*.

Umar, Muhammad dkk., 2013, Optimizing the Synthesis of Ethyl tert-Butyl Ether in Continuous Catalytic Distillation Column Using New Ion Exchange Resin Catalyst, *Chinese Journal of Chemical Engineering*.

Vila M. dkk., 1993, Equilibrium Constants For ETBE Liquid Phase Synthesis, *Chemical Engineering Community*.

Wang, Y., Chui, P., Ma, Y. dan Zhang, Z., 2014, Extractive distillation and pressure-swing distillation fot THF/ethanol separation, *J Chem Technol Biotechnol*.

Yuan, H., 2006, *ETBE as An Additive in Gasoline: Advantages and Disadvantages*, Linköpings Universitet, Swedia.