

BAB V

KESIMPULAN DAN SARAN

5.1 Kesimpulan

1. Pengendalian *manipulated variable* berupa rasio *reflux* menghasilkan *overshoot*
2. Pengendalian *manipulated variable* berupa *reflux rate* menghasilkan *overshoot*
3. Pengendalian dengan *manipulated variable* berupa rasio *reflux* lebih baik dibandingkan dengan *reflux rate* karena osilasi yang dihasilkan dari *manipulated variable* berupa *reflux* lebih banyak dibandingkan dengan rasio *reflux*. Dari segi *error* pengendalian dengan *manipulated variable* berupa *reflux rate* lebih baik dibandingkan dengan rasio *reflux*
4. Penggunaan PID *controller* lebih baik dari PI *controller* karena menghasilkan *error* yang lebih kecil

5.2 Saran

1. Dapat dilakukan simulasi mengenai *two point control* agar dapat dapat mengendalikan kolom RD dengan lebih baik

DAFTAR PUSTAKA

- Al-Malah dan Kamal, I.M., 2017, *Chemical Engineering Applications*, John Wiley & Sons, Inc., New Jersey
- Andersen, I. B., 2012, *Methanol in Poisoning & Drug Overdose*, 6th Edition penyunt, New York: McGrawHill.
- Anggarani, R., Wibowo, C.S., Rulianto, D., 2014, Application of dimethyl ether as LPG substitution for household stove, *Energy Procedia*, 47, pp. 227-234
- Aspentech, 2001, *Aspen Physical Property System*, Aspen Technology Inc, U.S.A
- Bildea, C.S., Győrgy, R., Brunchi, C.C., Kiss, A.A., 2017, Optimal design of intensified processes for DME synthesis, *Computers and Chemical Engineering*, 105, pp. 142-151
- Boedoyo, M.S., 2010, Pemanfaatan dimethyl ether (DME) sebagai substitusi bahan bakar minyak dan LPG, *Jurnal Teknik Lingkungan*, 11, pp. 301-311
- Chinchen, G.C., Mansfield, K., Spencer, M.S., 1990, The methanol synthesis: how does it work, *CHEMTECH*, 20:11
- Chumaidi, A., Moentamaria, D., dan Murdani, A., 2016, Dehidrasi metanol menjadi dimetil eter dengan memodifikasi katalis CuO-ZnO/ γ -Al₂O₃, *Prosiding SENTIA*, 8
- Fleisch, T.H., Basu, A., Gradassi, M.J., dan Masin, J.G., 1997, Dimethyl ether: a fuel for the 21st century, *Natural Gas Conversion IV*, 107
- Gorak, A. dan Sorensen, E., 2014, *Distillation: Fundamentals and Principles*, edisi 1, Elsevier Inc., Oxford
- Hosseininejad, S., Afacan, A., dan Hayes, R.E., 2012, Catalytic and kinetic study of methanol mehydratation to dimethyl ether, *Chemical Engineering Research and Design*, 90, pp. 825-833
- Kiss, A.A., 2013, *Advanced Distillation Technologies*, edisi 1, John Wiley and Sons Ltd, United Kingdom, pp. 23
- Lei, Z., Zou, Z., Dai, C., Li, Q., dan Chen, B., 2011, Synthesis of dimethyl ether (DME) by catalytic distillation, *Chemical Engineering Science*, 66, pp. 3195-3203
- Luyben, M.L. dan Luyben, W.L., 1997, *Essentials of Process Control*, The McGraw-Hill Companies, Inc., Singapore
- Luyben, W.L. dan Yu, C.C., 2008, *Reactive Distillation Design and Control*, edisi 1, John Wiley & Sons, Inc., New Jersey
- Mondal, U., Yadav, G.D., 2019, Perspective of dimethyl ether as fuel: part 1. catalysis, *Journal of CO₂ Utilization*, pp. 1-22
- Murai, N., Nakamichi, K., Otake, M., dan Ushikubo, T., 1985, Process for the production of dimethyl ether useful as a propellant, *United States Patent No. 604,943*
- Ogawa, T., Inoue, N., Shikada, T., dan Ohno, Y., 2003, Direct dimethyl ether synthesis, *Journal of Natural Gas Chemistry*, 12, pp. 219-227
- Rasmito, A. dan Wulandari, Y., 2010, The use of Wilson equation, NRTL and UNIQUAC in predicting VLE of ternary systems, *Jurnal Teknik Kimia*, 4, pp. 304-308
- Sabour, B., Peyrovi, M.H., Hamoule, T., dan Rashidzadeh, M., Catalytic dehydration of methanol to dimethyl ether (DME) over Al-HMS catalyst, *Journal of Industrial and Engineering Chemistry*, 20, pp. 222-227

- Sasongko, D., Luthan, A.F.H., dan Wulandari, W., 2016, Modified two-step dimethyl ether (DME) synthesis simulation from Indonesian brown coal, *Journal Engineering and Technological Sciences*, 48, pp. 320-333
- Seader, J.D., dan Henley, E.J., 2001, *Separation Process Principles*, edisi 2, John Wiley and Sons, U.S.A
- Seborg, D.E., Edgar, T.F., dan Mellichamp, D.A., 2004, *Process Dynamics and Control*, edisi 2, John Wiley & Sons, Inc., USA
- Semelsberger, T.A., Borup, R.L., dan Greene, H.L., 2006, Dimethyl ether (DME) as an alternative fuel, *Journal of Power Sources*, 156, pp. 497-511
- Stephanopoulos, G., 1984, *Chemical Process Control*, Prentice Hall, New Jersey
- Sung, D.M., Kim, Y.H., Park, E.D., dan Yie, J.E., 2010, Correlation between acidity and catalytic activity for the methanol dehydration over various aluminum oxides, *Research on Chemical Intermediates*, 36, pp. 653-660
- Vakili, R., Pourazadi, E., Setoodeh, P., Eslamloueyan, R., dan Rahimpour, M. R., 2011, Direct dimethyl ether (DME) synthesis through a thermally coupled heat exchanger reactor, *Applied Energy*, 88, pp. 1211-1223
- Wahid, A., dan Putra, I.G.E.P., 2018, Multivariable model predictive control design of reactive distillation column for dimethyl ether production, *IOP Conference Series: Materials Science and Engineering*, 334
- Zhu, Y., Wang, S., Ge, X., Liu, Q., Luo, Z., dan Cen, K., 2010, Experimental study of improved two step synthesis for DME production, *Fuel Processing Technology*, 91, pp. 424-429