

## DAFTAR PUSTAKA

- Aboul-Gheit, A. K., Gad, F. K., Abdel-Aleem, G. M., El-Desouki, D. S., Hmaid, S. M. A., Ghoniem, S. A., and Ibrahim, A. H., 2014, Pt, Re and Pt-Re Incorporation in Sulfated Zirconia as Catalyst for Pentane Isomeration, *Egypt. J. Pet.*, 23, 303-314.
- Amin, A.K., Trisunaryanti, W., and Wijaya, K., 2019b, Effect of Promoters and Calcination Temperature on Surface and Acidity of Modified Zirconia, *J. Nano Res.*, 57, 31–39.
- Bagheri, S., Muhd Julkapli, N., and Bee Abd Hamid, S., 2014, Titanium Dioxide as A Catalyst Support in Heterogeneous Catalysis, *Sci. World J.*, 2014, 1-21.
- Benaïssa, M., Santiesteban, J.G., Díaz, G., Chang, C.D., and José-Yacamán, M., 1996, Interaction of Sulfate Groups with the Surface of Zirconia: An HRTEM Characterization Study, *J. Catal.*, 161, 694–703.
- Bezergianni, S. and Kalogianni, A., 2009, Hydrocracking of Used Cooking Oil for Biofuels Production, *Bioresour. Technol.*, 100, 3927–3932.
- Das, D., Mishra, H.K., Dalai, A.K., and Parida, K.M., 2004, Iron, and Manganese Doped  $\text{SO}_4^{2-}/\text{ZrO}_2\text{-TiO}_2$  Mixed Oxide Catalysts: Studies on Acidity and Benzene Isopropylation Activity, *Catal. Letters*, 93, 185–193.
- Clearfield, A., Serrette, G.P.D., and Khazi-Syed, A.H., 1994, Nature of Hydrous Zirconia and Sulfated Hydrous Zirconia, *Catal. Today*, 20(2), 295-312.
- Eko, A. and Rob, B., 2018, The Effect of Calcination Temperature of Sulfated Zirconia Catalyst for Simultaneous Reactions in Biodiesel Production, *Res. J. Chem. Environ.*, 22, 157–162.
- Escobar, J.C., Lora, E.S., Venturini, O.J., Yáñez, E.E., Castillo, E.F., and Almazan, O., 2009, Biofuels: Environment, Technology and Food Security, *Renew. Sustain. Energy Rev.*, 13, 75-87.
- Fan, K., Liu, L., Yang, X., and Rong, L., 2015, Effect of Keggin-Type Heteropolyacids on the Hydrocracking of Jatropha Oil, *RSC Adv.*, 5, 37916-37924.
- Föttinger, K., Zorn, K., and Vinek, H., 2005, Influence of the Sulfate Content on the Activity of Pt Containing Sulfated Zirconia, *Applied Catalyst: A General*, 284, 69-75.
- Fu, B. Gao, L., Niu, L., Wei, R., and Xiao, G., 2009, Biodiesel from Waste Cooking Oil via Heterogeneous Superacid Catalyst  $\text{SO}_4^{2-}/\text{ZrO}_2$ , *Energy and Fuels*, 23, 569-572.
- Guldhe, A., Singh, P., Ansari, F.A., Singh, B., and Bux, F., 2017, Biodiesel Synthesis from Microalgal Lipids Using Tungstated Zirconia as A Heterogeneous Acid Catalyst and Its Comparison With Homogeneous Acid

and Enzyme Catalysts, *Fuel*, 187, 180–188.

- Gurushantha, K., Anantharaju, K. S., Nagabhushana, H., Sharmac, S. C., Vidyad, Y. S., Shivakumarae, C., Nagaswarupaa, H. P., Prashanthaa, S. C., and Anilkumar, M. R., 2014, Facile Green Fabrication of Iron-Doped Cubic ZrO<sub>2</sub> Nanoparticles by *Phyllanthus acidus*: Structural, Photocatalytic and Photoluminescent Properties, *J. Mol. Catal. A: Chem.*, 397, 36-47.
- Han, Y. and Zhu, J., 2013, Surface Science Studies on the Zirconia-Based Model Catalysts, *Top. Catal.*, 56, 15-17.
- Hasanudin, Said, M., Faizal, M., Dahlan, M. H., and Wijaya, K., 2012, Hydrocracking of Oil Residue from Palm Oil Mill Effluent to Biofuel, *Sustainable Environmental Research*, 22(6), 395-394.
- Hasibuan, H.A., 2017, Penggunaan Kembali Katalis Nikel Bekas untuk Hidrogenasi Minyak Sawit dan Minyak Inti Sawit, *Warta IHP*, 34(1), 18-25.
- Hassan, S.N., Sani, Y.M., Abdul Aziz, A.R., Sulaiman, N.M.N., and Daud, W.M.A.W., 2015, Biogasoline: An Out-of-the-Box Solution to the Food-for-Fuel and Land-Use Competitions, *Energy Convers. Manag.*, 89, 349-367.
- Hauli, L., Wijaya, K., and Armunanto, R., 2018, Preparation and Characterization of Sulfated Zirconia from a Commercial Zirconia Nanopowder, *Orient. J. Chem.*, 34(3), 1559-1564.
- Heshmatpour, F. and Aghakhanpour, R.B., 2012, Synthesis and Characterization of Superfine Pure Tetragonal Nanocrystalline Sulfated Zirconia Powder by A Non-Alkoxide Sol-Gel Route, *Adv. Powder Technol.*, 23(1), 80-87.
- Hidayat, A., Rochmadi, Wijaya, K., Hinode, H., and Budiman, A., 2013, Comparison of Activated Carbons Prepared from Indonesian Forest and Agricultural Residues, *Asian J. Chem.*, 25(3), 1569-1575.
- Huang, D., Zhou, H., and Lin, L., 2012, Biodiesel: An Alternative to Conventional Fuel, *Energy Procedia*, 16, 1874–1885.
- Jujarama, Wijaya, K., Fahrurrozi, M. dan Suheryanto, 2014, Synthesis of Biogasoline from Used Palm Cooking Oil Through Catalytic Hydrocracking by Using Cr-activated Natural Zeolite as Catalyst, *Asian J. Chem.*, 25(14), 5033-5038.
- Junaidi, H.F., 2012, Uji Aktivitas dan Selektivitas Katalis Ni/H<sub>5</sub>NZA dalam Proses Hidrorengkah Metil Ester Minyak Kelapa Sawit (Mepo) Menjadi Senyawa Hidrokarbon Fraksi Pendek, *Skripsi*, Program Studi Kimia Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Jember, Jember.
- Kadarwanti, S., Rahmawati, F., Rahyu, P.E., Wahyuni, S., and Supardi, K.I., 2013, Kinetics and Mechanism of Ni/Zeolite-Catalyzed Hydrocacking of Palm Oil into Biofuel, *Indones. J. Chem.*, 13(1), 77-85.
- Kumar, A. Shailey, S., Agarwal, S., Badoni, R.P., and Tripathi, A.R., 2017,

- Hydrothermal Synthesis of Mesoporous Sulphated Zirconia, *Int. J. Chemtech Res.*, 10(7), 350-358
- Kuncoro, T.D., Darwito, P.A., and Arifianto, D., 2019, Impact of Palm Oil of Biodiesel on Industrial Diesel Engine Performance For Application In Mining, *AIP Conf. Proc.*, 2088, 1-13.
- Li, T., Cheng, J., Huang, R., Yang, W., Zhou, J., and Cen, K., 2016, Hydrocracking of Palm Oil to Jet Biofuel Over Different Zeolites, *Int. J. Hydrogen Energy*, 41, 21883–21887.
- Li, Z.J., Prescott, H.A., Deutsch, J., Trunschke, A., Lieske, H., and Kemnitz, E., 2004, Characterization and Catalytic Behavior of Potassium-Modified ZrO<sub>2</sub> Base Catalysts, *Catal. Letters*, 82(3), 175-180.
- Liang, J., Liang, Z., Zou, R., and Zhao, Y., 2017, Heterogeneous Catalysis in Zeolites, Mesoporous Silica, and Metal–Organic Frameworks, *Adv. Mater.*, 29(30), 1701139.
- Ma, Z., Meng, X., Liu, N., and Shi, L., 2018, Pd-Ni Doped Sulfated Zirconia : Study of Hydrogen Spillover and Isomerization of n-Hexane, *J. Mol.*, 449, 114–121.
- Mampuru, M.B., Nkazi, D.B., and Mukaya, H.E., 2019, Hydrocracking of Waste Cooking Oil into Biogasoline in The Presence of a Bi-functional Ni-Mo/Alumina Catalyst, *Energy Sources, Part A Recover. Util. Environ. Eff.*, 1, 1–12.
- Mirzayanti, Y.W., Roesyadi, A., and Prajitno, D.H., 2019, Triglyceride of Kapok Seed Oil to Biofuel over a Synthesised Cu-Mo Supported HZSM-5 Catalyst, *Conference Series: Materials Science and Engineering*, 462, 012023.
- Mulyaningsih, A., 2012, Uji Aktivitas Moni/Bentonit Hasil Preparasi Pada Reaksi Hidrogenasi Perengkahan Katalitik Asam Oleat, *Skripsi*, Program Studi Kimia Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Pendidikan Indonesia, Bandung.
- Munir, D., Irfan, M.F., and Usman, M.R., 2018, Hydrocracking of Virgin and Waste Plastics: A Detailed Review, *Renew. Sustain. Energy Rev.*, 90, 490-515.
- Munnik, P., De Jongh, P.E., and De Jong, K.P., 2015, Recent Developments in the Synthesis of Supported Catalysts, *Chem. Rev.*, 115(14), 6687-6718.
- Nam, L.T.H., Vinh, T.Q., Loan, N.T.T., Tho, V.D.S., Yang, X.Y., and Su, B.L., 2011, Preparation Of Bio-Fuels by Catalytic Cracking Reaction of Vegetable Oil Sludge, *Fuel*, 90, 1069–1075.
- Oh, T.H., Hasanuzzaman, M., Selvaraj, J., Teo, S.C., and Chua, S.C., 2018, Energy Policy and Alternative Energy in Malaysia: Issues and Challenges for Sustainable Growth – An Update, *Renew. Sustain. Energy Rev.*, 81, 3021–3031.
- Pagliuso, J.D. and Martins, M.E.S., 2009, Biofuels for Spark-Ignition Engines,

*Advanced Direct Injection Combustion Engine Technologies and Development: Gasoline and Gas Engines*, 1, 229-259.

- Patel, A., Brahmkhatri, V., and Singh, N., 2013, Biodiesel Production by Esterification of Free Fatty Acid Over Sulfated Zirconia, *Renew. Energy*, 51, 227–233.
- Prihandana, R., Noerwijari, K., Gamawati, P., Adinurani., Setyaningsih, D., Setiadi, S., and Hendroko, R., 2007, *Bioetanol Ubi Kayu Bakar Masa Depan*, Penebar Swadaya, Jakarta.
- Purwono, S., Trisunaryanti, W., Salamah, S., Hasim, W., Arenal., 2006, Hydrocracking Aspal Buton dengan Katalisator Nikel-Paladium Ni-Pd dalam Pengembangan Zeolit, *Forum Teknik*, 30 (2), 106-119.
- Puteri, N.J., 2013, Sintesis, Karakterisasi Dan Uji Aktivitas Katalis Ni/ZrO<sub>2</sub>-SO<sub>4</sub> Pada Reaksi Hidrorengkah Minyak Kelapa Menjadi Biofuel, *Skripsi*, Program Studi Kimia Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Gadjah Mada, Yogyakarta.
- Qi, X., Watanabe, M., Aida, T.M., and Smith, R.L., 2009, Sulfated Zirconia as a Solid Acid Catalyst for the Dehydration of Fructose to 5-Hydroxymethylfurfural, *Catal. Commun.*, 10, 1771–1775.
- Rabee, A.I.M., Mekhemer, G.A.H., Osatiashtiani, A., Isaacs, M.A., Lee, A.F., Wilson, K., and Zaki, M.I., 2017, Acidity-Reactivity Relationships in Catalytic Esterification Over Ammonium Sulfate-Derived Sulfated Zirconia, *Catalysts*, 7, 204.
- Rahayu, F. I., Nuryanto, R., and Suyati, L., 2013, Pengaruh Diameter Kanal Pelet Katalis Zeolit Aktif dan Ni-Zeolit Terhadap Pirolisis Limbah Batang Pohon Sagu (Metroxylon sp.), *J. KSA*, 16, 33–37.
- Ruslan, Rasman, M., Hassan, N.A., Hainin, M.R., Putra Jaya, R., Haryati, Y., Shukry, N.A.M., et al., 2018, Engineering Properties of Bitumen Modified with Bio-oil, *MATEC Web Conf.*, 250, 02003.
- Sakti M., Wijaya, K., Trisunaryanti, W., Saputri, W.D., Herald, E., Yuwana, N.W., et al., 2020, The Synthesis of SO<sub>4</sub>/ZrO<sub>2</sub> and Zr/CaO Catalysts via Hydrothermal Treatment and Their Application for Conversion of Low-Grade Coconut Oil into Biodiesel, *J. Environ. Chem. Eng.*, 8(5), 104125
- Shi, G., Yu, F., Wang, Y., Pan, D., Wang, H., and Li, R., 2016, A Novel One-Pot Synthesis of Tetragonal Sulfated Zirconia Catalyst With High Activity for Biodiesel Production from the Transesterification of Soybean Oil, *Renew. Energy*, 342, 158-163.
- Shibasaki-Kitakawa, N., Honda, H., Kuribayashi, H., Toda, T., Fukumura, T., and Yonemoto, T., 2007, Biodiesel Production Using Anionic Ion-Exchange Resin as Heterogeneous Catalyst, *Bioresour. Technol.*, 98(2), 416-421.

- Song, Y., Tian, J., Ye, Y., Jin, Y., Zhou, X., Wang, J.A., and Xu, L., 2013, Effects of Calcination Temperature and Water-Washing Treatment on N-Hexane Hydroisomerization Behavior of Pt-Promoted Sulfated Zirconia Based Catalysts, *Catalysis Today*, 212, 108-114.
- Srinivasan, R., Keogh, R.A., Milburn, D.R., and Davis, B.H., 1995, Sulfated Zirconia Catalysts: Characterization by TGA/DTA Mass Spectrometry, *J. Catal.*, 153, 123–130.
- Sun, Y., Ma, S., Du, Y., Yuan, L., Wang, S., Yang, J., 2005, Solvent-Free Preparation of Nanosized Sulfated Zirconia with Brønsted Acidic Sites from A Simple Calcination, *J. Phys. Chem. B*, 109(7), 2567-2572.
- Susanto, H.B., Nasikin, M., Hirsaman, A.M., dan Wijanarko, A., 2009, Biogasoline from Palm Oil by Simultaneous Cracking and Hydrogenation Reaction Over Nimo/zeolit Catalyst, *IDOSI Publication*, 74-76, 1818-4952.
- Suseno, A., Wijaya, K., Trisunaryanti, W., and Roto, 2018, Synthesis and Characterization of Ni-Cu Doped Zirconia-Pillared Bentonite, *Orient. J. Chem.*, 34(3), 1-5.
- Syamsiro, M., Saptoadi, H., Norsujianto, T., Noviasri, P., Cheng, S., Alimuddin, Z., and Yoshikawa, K., 2014, Fuel Oil Production from Municipal Plastic Wastes in Sequential Pyrolysis and Catalytic Performing Reactors, *Energy Procedia*, 47, 180-188.
- Triyono, 2002, *Kimia Katalis*, Universitas Gadjah Mada, Yogyakarta.
- Tsuchida, T., Yoshioka, T., Sakuma, S., Takeguchi, T., and Ueda, W., 2008, Synthesis of Biogasoline from Ethanol over Hydroxyapatite Catalyst, *Ind. Eng. Chem. Res.*, 47(5), 1443-1452.
- Tyagi, B., Sidhpuria, K., Shaik, B., and Jasra, R.V., 2006, Synthesis of Nanocrystalline Zirconia Using Sol-Gel and Precipitation Techniques, *Ind. Eng. Chem. Res.*, 45(25), 8643-8650.
- Utami, M., Wijaya, K., and Trisunaryanti, W., 2018, Pt-Promoted Sulfated Zirconia as Catalyst for Hydrocracking of LDPE Plastic Waste Into Liquid Fuels, *Mater. Chem. Phys.*, 213, 548–555.
- Veiga, S. and Bussi, J., 2016, Efficient Conversion of Glycerol to a H<sub>2</sub> Rich Gas Mixture by Steam Reforming over NiLaZr Catalysts, *Top. Catal.*, 59(2), 186-195.
- Viswanathan, B., 2017, Biochemical Routes for Energy Conversion, *Energy Sources.*, 1, 357-368.
- Wan Omar, W.N.N. and Saidina Amin, N.A., 2011, Optimization of Heterogeneous Biodiesel Production from Waste Cooking Palm Oil via Response Surface Methodology, *Biomass and Bioenergy*, 35(3), 1329-1328.
- Wijaya, K., Baobalabuana, G., Trisunaryanti, W., and Syoufian, A., 2013,

Hydrocracking of Palm Oil into Biogasoline Catalyzed by Cr/Natural Zeolite, *Asian J. Chem.*, 25, 8981–8986.

Yu, S., Jiang, P., Dong, Y., Zhang, P., Zhang, Y., and Zhang, W., 2012, Hydrothermal Synthesis of Nanosized Sulfated Zirconia as an Efficient and Reusable Catalyst for Esterification of Acetic Acid with n-Butanol, *Bull. Korean. Chem. Soc.*, 33, 524-528

Zargar, M., Ahmadinia, E., Asli, H., Karim, M.R., and Karimi, A., 2012, Novelty on Using Waste Cooking Oil as Bitumen Rejuvenator,. In, *7th International Conference on Maintenance and Rehabilitation of Pavements and Technological Control, MAIREPAV 2012*.

Zarubica, A.R., Miljkovic, M.N., Kiss, E.E., and Boskovic, G.C., 2007, Benefits of Mesopores in Sulfated Zirconia Catalyst, *React. Kinet. Catal. Lett.*, 90, 145-150.