

DAFTAR PUSTAKA

- Abdilla-Santes, R. M., Agarwal, S., Xi, X., Heeres, H., Deuss, P. J., and Heeres, H. J., 2020, "Valorization of Humin Type Byproducts from Pyrolytic Sugar Conversions to Biobased Chemicals", *J. Anal. Appl. Pyrolysis*, 152(104963), 1-10.
- Ahlkvist, J., Warna, J., Salmi, T., and Mikkola, J., 2016, "Heterogeneously Catalyzed Conversion of Nordic Pulp to Levulinic and Formic Acid", *React. Kinet. Mech. Catal.*, 119, 415-427.
- Alcocer-García, H., Segovia-Hernández, J.G., Prado-Rubio, O.A., Sánchez-Ramírez, E., and Quiroz-Ramírez, J.J., 2019, "Multi-objective Optimization of Intensified Processes for The Purification of Levulinic Acid Involving Economic and Environmental Objectives", *Chem. Eng. Process*, 136, 123–137.
- Anggorowati, H., Jamilatun, S., Cahyono, R. B., and Budiman, A., 2018, "Effect of Hydrochloric Acid Concentration on The Conversion of Sugarcane Bagasse to Levulinic Acid", *IOP Conf. Ser. Mater. Sci. Eng.*, 299, 1-6.
- Antonetti, C., Licursi, D., Fulignati, S., Valentini, G., and Galletti, A. M. R., 2016, "New Frontiers in The Catalytic Synthesis of Levulinic Acid: From Sugars to Raw and Waste Biomass as Starting Feedstock", *Catalysts*, 6(196), 1-29.
- Awoyale, A. A., and Lokhat, D., 2021, "Experimental Determination of The Effects of Pretreatment on Selected Nigerian Lignocellulosic Biomass in Bioethanol Production", *Sci. Rep.*, 11(557), 1–16.
- Behnood, R., Anvaripour, B., Jaafarzadeh, N., Farasati, M., 2016, "Oil Spill Sorption Using Raw and Acetylated Sugarcane Bagasse", *J. Cent. South. Univ.*, 23, 1618–1625.
- Bevilaqua, D. B., Rambo, M. K. D., Rizzetti, T. M., Cardoso, A. L., and Martins, A. F., 2013, "Levulinic Acid from Rice Husks," *J. Clean. Prod.*, 47, 96–101.
- Bicker, M., Hirth, J., and Vogel, H., 2003, "Dehydration of Fructose to 5-Hydroxymethylfurfural in Sub- and Supercritical Acetone," *Green. Chem.*, 5, 280–284.
- Bond, J. Q., Alonso, D. M., Wang, D., West, R. M., and Dumesic, J. A., 2010, "Integrated Catalytic Conversion of γ -Valerolactone to Liquid Alkenes for Transportation Fuels", *Science*, 327, 1110–1115.

- Boonyakarn, T., Wataniyakul, P., Boonnoun, P., Quitain, A. T., Kida, T., Sasaki, M., Laosiripojana, N., Jongsomjit, B., and Shotipruk, A., 2019, “Enhanced Levulinic Acid Production from Cellulose by Combined Bronsted Hydrothermal Carbon and Lewis Acid Catalysts”, *Ind. Eng. Chem. Res.*, 58, 2697-2703.
- Bounoukta, C.E., Megias-Sagayo, C., Ammari, F., Ivanova, S., Monzon, A., Centeno, M.A., and Odriozola, J.A., 2021, “Dehydration of Glucose to 5-Hydroxymethylfurfural on Bifunctional Carbon Catalysts”, *Appl. Catal. B.*, 256, 1-10.
- Bozell, J. J., Moens, L., Elliott, D. C., Wang, Y., Neuenschwander, G. G., Fitzpatrick, S. W., Bilski, R. J., Jarnefeld, J. L., 2000, “Production of Levulinic Acid and Use As A Platform Chemical for Derived Products,” *Resour. Conserv. Recycl.*, 28, 227–239.
- Chandel, A. K., Antunes, F. A. F., Anjos, V., Bell, M. J. V., Rodrigues, L. N., Polikarpov, I., de Azevedo, E. R., Bernardinelli, O. D., Rosa, C. A., Pagnocca, F., C., and da Silva, S. S., 2014, “Multi-scale Structural and Chemical Analysis of Sugarcane Bagasse in The Process of Sequential Acid-Base Pretreatment and Ethanol Production by *Scheffersomyces shehatae* and *Saccharomyces cerevisiae*”, *Biotechnol. Biofuels*, 7, 1-14.
- Chang, C., Ma, X., and Cen, P., 2006, “Kinetics of Levulinic Acid Formation from Glucose Decomposition at High Temperature”, *Chin. J. Chem. Eng.*, 14, 708-712.
- Chang, C., Ma, X., and Cen, P., 2007, “Levulinic Acid Production from Wheat Straw”, *Bioresour. Technol.*, 98, 1448-1453.
- Chang, C., Ma, X., and Cen, P., 2009, “Kinetics Studies on Wheat Straw Hydrolysis to Levulinic Acid”, *Chin. J. Chem. Eng.*, 17(5), 835-839.
- Chen, W., Hu, H., Cai, Q., and Zhang, S., 2020, “Synergistic Effect of Furfural and Sulfuric Acid on The Decomposition of Levulinic Acid”, *Energy Fuels*, 34, 2238-2245.
- Conde-mejía, C., Jiménez-gutiérrez, A., and El-halwagi, M., 2011, “A Comparison of Pretreatment Methods for Bioethanol Production from Lignocellulosic Materials,” *Process Saf. Environ. Prot.*, 90, 189–202.
- Deng, W., Zhang, Q., and Wang, Y., 2015, “Catalytic Transformations of Cellulose and Its Derived Carbohydrates into 5-hydroxymethylfurfural, Levulinic Acid, and Lactic Acid”, *Sci. China Chem.*, 58, 29-46.

- Dimos, K., Paschos, T., Louloudi, A., Kalogiannis, K. G., Lappas, A. A., Papayannakos, N., Kekos, D., Mamma, D., 2019, "Effect of Various Pretreatment Methods on Bioethanol Production from Cotton Stalks", *Fermentation*, 5(5), 1–12.
- Dussan, K., Girisuta, B., Haverty, D., Leahy, J. J., and Hayes, M. H. B., 2013, "Kinetics of Levulinic Acid and Furfural Production from *Miscanthus giganteus*," *Bioresour. Technol.*, 149, 216–224.
- Fachri, B. A., Abdilla, R. M., van de Bovenkamp, H. H., Rasrendra, C. B., and Heeres H. J., 2015, "Experimental and Kinetic Modeling Studies on The Sulfuric Acid Catalyzed Conversion of D-Fructose to 5-Hydroxymethylfurfural and Levulinic Acid in Water", *Sustain. Chem. Eng.*, 2, 3024-3034.
- Falco, C., Baccile, N., and Titirici, M. M., 2011, "Morphological and Structural Differences between Glucose, Cellulose and Lignocellulosic Biomass Derived Hydrothermal Carbons", *Green Chem.*, 13(11), 3273–3281.
- Fang, Q., and Hanna, M. A., 2002, "Experimental Studies for Levulinic Acid Production from Whole Kernel Grain Sorghum," *Bioresour. Technol.*, 81, 187–192.
- Farzad, S., Mandegari, M. A., Guo, M., Haigh, K. F., Shah, N., and Görgens, J. F., 2017, "Multi-product Biorefineries from Lignocelluloses: A Pathway to Revitalisation of The Sugar Industry", *Biotechnol. Biofuels*, 10(87), 1–24.
- Feng, J., Tong, L., Xu, Y., Jiang, J., Hse, V., and Yang, Z., 2020, "Synchronous Conversion of Lignocellulosic Polysaccharides to Levulinic Acid with Synergic Bifunctional Catalysts in a Biphasic Cosolvent System", *Ind. Crop. Prod.*, 145, 1–9.
- Fogler, H.S., 2006. *Elements of Chemical Reaction Engineering*. Prentice Hall, Upper Saddle River.
- Galletti, A. M. R., Antonetti, C., Luise, V. D., Licursi, D., and Nasso, N. N. O. D., 2012, "Levulinic Acid Production from Waste Biomass," *BioResources*, 7, 1824–1835.
- Gao, Y., Xu, J., Zhang, Y., Yu, Q., Yuan, Z., Liu, Y., 2013, "Effects of Different Pretreatment Methods on Chemical Composition of Sugarcane Bagasse and Enzymatic Hydrolysis", *Bioresour. Technol.*, 144, 396–400.
- Girisuta, B., Dussan, K., Haverty, D., Leahy, J. J., and Hayes, M. H. B., 2013, "A Kinetic Study of Acid Catalysed Hydrolysis of Sugarcane Bagasse to Levulinic Acid," *Chem. Eng. J.*, 217, 61–70.

- Girisuta, B., Janssen, L. P. B. M., and Heeres, H. J., 2006, "A Kinetic Study on the Conversion of Glucose to Levulinic Acid," *Green Chem.*, 84, 339-349.
- Girisuta, B., Janssen, L. P. B. M., and Heeres, H. J., 2007, "Kinetic Study on the Acid-Catalyzed Hydrolysis of Cellulose to Levulinic Acid," *Ind. Eng. Chem. Resour.*, 46, 1696-1708.
- González-García, S., Moreira, M. T., Feijoo, G., and Murphy, R. J., 2012, "Comparative Life Cycle Assessment of Ethanol Production from Fast-growing Wood Crops (Black Locust, Eucalyptus and Poplar)", *Biomass Bioenergy*, 39, 378-388.
- Gozan, M., Panjaitan, J. R. H., Tristantini, D., Alamsyah, R., Yoo, Y. J., 2018, "Evaluation of Separate and Simultaneous Kinetic Parameters for Levulinic Acid and Furfural Production from Pretreated Palm Oil Empty Fruit Bunches", *Int. J. Chem. Eng.*, 2018, 1-12.
- Gupta, P. K., Raghunath, S. S., Prasanna, D. V., and Shree, V., 2019, An Update on Overview of Cellulose, Its Structure and Applications, *IntechOpen*, 1-21.
- Hafyan, R. H., Bhullar, L., Putra, Z. A., Bilad, M. R., Wirzal, M. D. H., and Nordin, N. A. H. M., 2020, "Multi-objective Sustainability Assessment of Levulinic Acid Production from Empty Fruit Bunch", *Process Integr. Optim. Sustain.*, 4, 37-50.
- Hayes, M. H. B., Mylotte, R., and Swift, R. S., 2017, "Humin: Its Composition and Importance in Soil Organic Matter", In *Advances in Agronomy* (1st ed., Vol. 143). Elsevier Inc.
- Herbst, A., and Janiak, C., 2016, "Selective Glucose Conversion to 5-HMF instead of Levulinic Acid with MIL-101Cr MOF-derivatives", *New J. Chem.*, 40, 7958-7967.
- Isikgor, F. H., and Becer, C. R., 2015, "Lignocellulose Biomass: A Sustainable Platform for The Production of Bio-Based Chemicals and Polymers," *Polym. Chem.*, 6, 4497-4559.
- Jain, A., Wei, Y., and Tietje, A., 2016, "Biochemical Conversion of Sugarcane Bagasse into Bioproducts," *Biomass Bioenergy*, 93, 227-242.
- Janghathaikul, D., and Gheewala, S.H., 2005, "Environmental Assessment of Power Generation from Bagasse at A Sugar Factory in Thailand", *Int. Energy J.*, 6(1), 57-66.
- Jeong, G., and Kim, S., 2021, "Thermochemical Conversion of Defatted Microalgae *Scenedesmus obliquus* into Levulinic and Formic Acids", *Fuel*, 283, 1-7.

- Jeong, H., Jang, S., Hong, C., Kim, S., 2017, "Levulinic Acid Production by Two-Step Acidcatalyzed Treatment of *Quercus mongolica* Using Dilute Sulfuric Acid", *Bioresour. Technol.*, 225, 183–190.
- Jiang, Y., Yang, L., Bohn, C. M., Li, G., Han, D., Mosier, N. S., Miller, J. T., Kenttamaa, H. I., and Abu-Omar, M. M., 2015, "Speciation and Kinetic Study of Iron Promoted Sugar Conversion to 5-hydroxymethylfurfural (HMF) and Levulinic Acid (LA)", *Org. Chem. Front.*, 2(10), 1388–1396.
- Kabyemela, B. M., Adschiri, T., Malaluan, R. M., and Arai, K., 1997, "Kinetics of Glucose Epimerization and Decomposition in Subcritical", *Ind. Eng. Chem. Res.*, 36, 1552–1558.
- Kang, S. and Yu, J., 2016, "An Intensified Reaction Technology for High Levulinic Acid Concentration from Lignocellulosic Biomass," *Biomass Bioenergy*, 95, 214–220.
- Kang, S., and Yu, J., 2018, "Maintenance of A Highly Active Solid Acid Catalyst in Sugar Beet Molasses for Levulinic Acid Production", *Sugar Tech.*, 20, 182–193.
- Kang, S., Fu, J., and Zhang, G., 2018, "From Lignocellulosic Biomass to Levulinic Acid: A Review on Acid-Catalyzed Hydrolysis", *Renew. Sustain. Energy Rev.*, 94, 340–362.
- Kang, S., Fu, J., Zhou, N., Liu, R., Peng, Z., and Xu, Y., 2018, "Concentrated Levulinic Acid Production from Sugarcane Molasses", *Energy Fuels*, 32(3), 3526-3531.
- Kapanji, K. K., Farzad, S., and Johann, F. G., 2021, "Life Cycle and Sustainability Assessments of Biorefineries Producing Glucaric Acid, Sorbitol or Levulinic Acid Annexed to A Sugar Mill", *J. Clean. Prod.*, 295(126339), 1–11.
- Khoo, R. Z., Chow, W. S., and Ismail, H., 2018, "Sugarcane Bagasse Fiber and Its Cellulose Nanocrystals", *Cellulose*. 25, 4303–4330.
- Kohli, K., Prajapati, R., and Sharma, B.K., 2019, "Bio-based Chemicals from Renewable Biomass for Integrated Biorefineries:", *Energies*, 12(233), 1-40.
- Kupiainen, L., Ahola, J., and Tanskanen, J., 2011, "Kinetics of Glucose Decomposition in Formic Acid," *Chem. Eng. Res. Des.*, 89, 2706–2713.
- Kupiainen, L., and Ahola, J., 2014, "Kinetics of Formic Acid-catalyzed Cellulose Hydrolysis", *Bioresources*, 9(2), 2645–2658.
- Kuster, B. F. M., and Temmink, H. M. G., 1977, "The Influence of pH and Weak Acid Anions on The Dehydration of D-Fructose", *Carbohydr. Res.*, 54, 185-191.

- Leonard, H. R., 1956, "Levulinic Acid as A Chemical Basic Raw Material", *J. Ind. Chem. Eng.*, 48, 1331-1341.
- Li et al., 2009
- Liu, C., Lu, X., Yu, Z., Xiong, J., Bai, H., Zhang, R., 2020, "Production of Levulinic Acid from Cellulose and Cellulosic Biomass in Different Catalytic Systems", *Catalysts*, 10, 1-22.
- Liu, H. F., Zeng, F. X., Deng, L., Liao, B., Pang, H., and Guo, Q. X., 2013, "Brønsted Acidic Ionic Liquids Catalyze The High-Yield Production of Diphenolic Acid/Esters from Renewable Levulinic Acid", *Green. Chem.*, 15, 81–4.
- Liu, Y., Li, H., He, J., Zhao, W., Yang, T., and Yang, S., 2017, "Catalytic Conversion of Carbohydrates to Levulinic Acid with Mesoporous Niobium-containing Oxides", *Catal. Commun.*, 93, 20–24.
- Lopes, E. S., Dominices, K. M. C., Lopes, M. S., and Tovar, L. P., 2017, "Obtaining Levulinic Acid from Pretreated Sugarcane Bagasse," *Chem. Eng. Trans.*, 57, 145–150.
- Ma, Y., Wang, L., Li, H., Wang, T., and Zhang, R., 2018, "Selective Dehydration of Glucose into 5-Hydroxymethylfurfural by Ionic Liquid-ZrOCl₂ in Isopropanol", *Catalysts*, 8, 30-34.
- Maiti, S., Gallastegui, G., and Suresh, G., 2018, "Microwave-assisted One-pot Conversion of Agro-industrial Wastes into Levulinic Acid: An Alternate Approach," *Bioresour. Technol.*, 265, 471–479.
- Maity, S.K., 2015. "Opportunities, Recent Trends and Challenges of Integrated Biorefinery: Part I", *Renew. Sustain. Energ. Rev.*, 43, 1427–1445.
- Melati, R. B., Schmatz, A. A., Pagnocca, F., Contiero, J., Brienzo, M., 2017, "Sugarcane Bagasse: Production, Composition, Properties, and Feedstock Potential. In: Sugarcane: Production Systems, Uses and Economic Importance", Nova Science Publishers: Hauppauge, NY, USA.
- Morone, A., Apte, M., Pandey, R. A., 2015, "Levulinic Acid Production from Renewable Waste Resources: Bottlenecks, Potential Remedies, Advancements and Applications", *Renew. Sust. Energ. Rev.*, 51, 548-565.
- Mukherjee, A., Dumont, M. J., 2016, "Levulinic Acid Production from Starch Using Microwave and Oil Bath Heating: A Kinetic Modeling Approach", *Ind. Eng. Chem. Res.*, 55, 8941–8949.

- Mukherjee, A., Dumont, M. J., and Raghavan, V., 2015, “Sustainable Production of Hydroxymethylfurfural and Levulinic Acid: Challenges and Opportunities”, *Biomass Bioenergy*, 72, 143-183.
- Muranaka, Y., Suzuki, T., Sawanishi, H., Hasegawa, I., and Mae, K., 2014, “Effective Production of Levulinic Acid from Biomass through Pretreatment Using Phosphoric Acid, Hydrochloric Acid, or Ionic Liquid”, *Ind. Eng. Chem. Res.*, 53(29), 11611-11621.
- Nanda, S., Kozinski, J. A., and Dalai, A. K., 2016, “Lignocellulosic Biomass: A Review of Conversion Technologies and Fuel Products,” *Curr. Biochem. Eng.*, 3, 24–36.
- Nikolla, E., Román-Leshkav, Y., Moliner, M., and Davis, M., 2011, “One-pot Synthesis of 5- (hydroxymethyl)furfural from Carbohydrates Using Tin-beta Zeolite”, *ACS Catal.*, 1, 408–410.
- Nugraha, A. S., and Utami, T. S., 2018, “The Effect of Pyrolysis Conditions to Produce Levoglucosan from Rice Straw”, *E3S Web of Conferences*, 67(03026), 1–5.
- Omari, K. W., Besaw, J. E., Kerton, F. M., 2012, “Hydrolysis of Chitosan to Yield Levulinic Acid and 5-hydroxymethylfurfural in Water Under Microwave Irradiation”, *Green. Chem.*, 14(5), 1480–1487.
- Oyola-rivera, O., Dumesic, J. A., and Cardona-martínez, N., 2019, “Catalytic Dehydration of Levoglucosan to Levoglucosenone Using Brønsted Solid Acid Catalysts in Tetrahydrofuran”, *Green Chem.*, 21, 4988-4999.
- Ozsen, A.Y., 2020, “Conversion of Biomass to Organic Acids by Liquefaction Reactions Under Subcritical Conditions”, *Front. Chem.*, 8, 1–14.
- Park, J., Kim, P., Jang, J., Wang, Z., Hwang, B., and Devries, K., 2008, “Interfacial Evaluation and Durability of Modified Jute Fibers / Polypropylene (PP) Composites Using Micromechanical Test and Acoustic Emission”, *Compos. Part B Eng.*, 39, 1042-1061.
- Park, M., Kim, S., and Jeong, G., 2018, “Production of Levulinic Acid from Glucosamine Using Zirconium Oxychloride”, *J. Ind. Eng. Chem.*, 61, 119-123.
- Pawelzik, P., Carus, M., Hotchkiss, J., Narayan, R., Selke, S., Wellisch, M., Weiss, M., Wicke, B., Patel, M.K., 2013, “Critical Aspects in The Life Cycle Assessment (LCA) of Bio-based Materials – Reviewing Methodologies and Deriving Recommendation”, *Resour. Conserv. Recy.*, 73, 211-228.

- Peng, L., Lin, L., Zhang, J., Zhuang, J., Zhang, B., Gong, Y., 2010, “Catalytic Conversion of Cellulose to Levulinic Acid by Metal Chlorides”, *Molecules*, 15, 5258–5272.
- Pileidis, F., and Titirici, M., 2016, “Levulinic Acid Biorefineries: New Challenges for Efficient Utilization of Biomass”, *Chem. Sus. Chem.*, 9, 1–22.
- Pulidindi, I. N., and Kim, T. H., 2018, “Conversion of Levulinic Acid from Various Herbaceous Biomass Species Using Hydrochloric Acid and Effects of Particle Size and Delignification”, *Energies*, 11(621), 1–12.
- Pyo, S. H., Glaser, S. J., Rehnberg, N., and Hatti-Kaul, R., 2020, “Clean Production of Levulinic Acid from Fructose and Glucose in Salt Water by Heterogeneous Catalytic Dehydration”, *ACS Omega*, 5(24), 14275–14282.
- Qi, X., Watanabe, M., Aida, T. M., and Smith, R. L., 2011, “Catalytic Conversion of Cellulose into 5-hydroxymethylfurfural in High Yields via A Two-step Process”, *Cellulose*, 18(5), 1327–1333.
- Qing, Q., Guo, Q., Wang, P., Qian, H., Gao, X., and Zhang, Y., 2018, “Kinetics Study of Levulinic Acid Production from Corncobs by Tin Tetrachloride as Catalyst”, *Bioresour. Technol.*, 260, 150-156.
- Qu, Y., Huang, C., Zhang, J., and Chen, B., 2012, “Efficient Dehydration of Fructose to 5-hydroxymethylfurfural Catalyzed by A Recyclable Sulfonated Organic Heteropolyacid Salt”, *Bioresour. Technol.*, 106, 170–172.
- Rabemanolontsoa, H., and Saka, S., 2016, “Various Pretreatments of Lignocellulosics”, *Bioresour. Technol.*, 199, pp. 83–91.
- Rackemann, D.W., Bartley, J.P., and Doherty, W.O.S., 2014, “Methanesulfonic acid-catalyzed conversion of glucose and xylose mixtures to levulinic acid and furfural”, *Ind. Crops Prod.*, 52, 46-57.
- Raghu, K. C., Aalto, M., Korpinen, O. J., Ranta, T., and Proskurina, S., 2020, “Lifecycle Assessment of Biomass Supply Chain with The Assistance of Agent-based Modelling”, *Sustainability*, 12(1964), 1–14.
- Ramli, N. A. S., and Amin, N. A. S., 2016, “Kinetic Study of Glucose Conversion to Levulinic Acid over Fe/HY Zeolite Catalyst”, *Chem. Eng. J.*, 283, 150–159.
- Ramli, N. A. S., and Amin, N. A. S., 2017, “Optimization of Biomass Conversion to Levulinic Acid in Acidic Ionic Liquid and Upgrading of Levulinic Acid to Ethyl Levulinate”, *Bioenergy Res.*, 10, 50-63.

- Restiawaty, E., Gani, K. P., Dewi, A., Arina, L.A., Kurniawati, K.I., Budhi, Y.W., and Akhmaloka, 2020, "Bioethanol Production from Sugarcane Bagasse Using *Neurospora intermedia* in an Airlift Bioreactor", *Int. J. Renew. Energy Dev.*, 9(2), 247-253.
- Rezende, C. A., de Lima, M. A., Maziero, P., de Azevedo, E. R., Garcia, W., and Polikarpov, I., 2011, "Chemical and Morphological Characterization of Sugarcane Bagasse Submitted to A Delignification Process for Enhanced Enzymatic Digestibility", *Biotechnol. Biofuels*, 4(54), 1-18.
- Rustemoglu, H., and Andres, A.R., 2016, "Determinants of CO₂ Emissions in Brazil and Russia between 1992 and 2011: A Decomposition Analysis", *Environ. Sci. Policy*, 58, 95-106.
- Ryu, J., Suh, Y. W., Suh, D. J., and Ahn, D. J., 2010, "Hydrothermal Preparation of Carbon Microspheres from Monosaccharides and Phenolic Compounds", *Carbon*, 48(7), 1990–1998.
- Saeman, J. F., 1945, "Hydrolysis of Cellulose and Decomposition of Sugars in Dilute Acid at High Temperature," *Ind. Eng. Chem.*, 37, 43-52.
- Satoh, H., Takahashi, K., and Kaga, H., 2004, "Production of Levoglucosan from Glucose in High Temperature Water", *APCChe*, 242, 1–7.
- Schmidt, L. M., Mthembu, L. D., Reddy, P., Deenadayalu, N., Kaltschmitt, M., and Smirnova, I., 2017, "Levulinic Acid Production Integrated into A Sugarcane Bagasse Based Biorefinery Using Thermal-enzymatic Pretreatment", *Ind. Crop Prod.*, 99, 172–178.
- Seretis, A., Diamantopoulou, P., Thanou, I., Tzevelekidis, P., Fakas, C., Lilas, P., Papadogianakis, G., 2020, "Recent Advances in Ruthenium-catalyzed Hydrogenation Reactions of Renewable Biomass-derived Levulinic Acid in Aqueous Media", *Front. Chem.*, 8, 1-22.
- Serrano-ruiz, J. C., Braden, D. J., West, R. M., and Dumesic, J. A., 2010, "Environmental Conversion of Cellulose to Hydrocarbon Fuels by Progressive Removal of Oxygen," *Applied Catal. B, Environ.*, 100, 184–189.
- Sevilla, M., and Fuertes, A. B., 2009a, "Chemical and Structural Properties of Carbonaceous Products Obatained by Hydrothermal Carbonization of Saccharides", *Chem. Eur. J.*, 15, 4195-4203.

- Sevilla, M., and Fuertes, A. B., 2009b, “The Production of Carbon Materials by Hydrothermal Carbonization of Cellulose”, *Carbon*, 47, 2281-2289.
- Shen, J., and Wyman, C. E., 2011, “Hydrochloric Acid-Catalyzed Levulinic Acid Formation from Cellulose: Data and Kinetic Model to Maximize Yields”, *AIChE J.*, 58, 236-246.
- Signoretto, M., Taghavi, S., Ghedini, E., Menegazo, F., 2019, “Catalytic Production of Levulinic Acid (LA) from Actual Biomass”, *Molecules*, 24, 1-20.
- Siregar, Y. D. I., Saepudin, E., Krisnandi, Y. K., 2020, “One-pot Reaction Conversion of Delignified Sorghum Bicolor Biomass into Levulinic Acid Using A Manganese Metal based Catalyst”, *Int. J. Technol.*, 11(4), 852–861.
- Song, J., Fan, H., Ma, J., and Han, B., 2013, “Conversion of Glucose and Cellulose into Value Added Products in Water and Ionic Liquids,” *Green Chem.*, 15, 2619-2635.
- Spath, P. L., and Mann, M. K., 2002, “Environmental Aspects of Producing Electricity from A Coal-Fired Power Generation System: A Life Cycle Assessment”, NREL. USA.
- Steinbach, D., Klier, A., Kruse, A., Sauer, J., Wild, S., and Zanker, M., 2020, “Isomerization of Glucose to Fructose in Hydrolysates from Lignocellulosic Biomass Using Hydrotalcite”, *Processes*, 8(644), 1-15.
- Sukmawan, R., Wildan, M. W., Saputri, L. H., Rochmadi, Rochardjo, H. S. B., 2019, “Microfibrillated Cellulose Extraction from Bagasse Using A Modified Kitchen Blender”, *Mater. Sci. Forum*, 948, 186–191.
- Sulaiman, A. A., Sulaeman, Y., Mustikasari, N., Nursyamsi, D., and Syakir, A. M., 2019, “Increasing Sugar Production in Indonesia Through Land Suitability Analysis and Sugar Mill Restructuring”, *Land*, 8(61), 1–17.
- Szabolcs, A., Molnar, M., Dibo, G., and Mika, L.T., 2013, “Microwave-assisted Conversion of Carbohydrates to Levulinic Acid: An Essential Step in Biomass Conversion”, *Green Chem.*, 15, 439-445.
- Takahashi, K., Satoh, H., Satoh, T., Kakuchi, T., Miura, M., Sasaki, A., Sasaki, M., and Kaga, H., 2009, “Formation Kinetics of Levoglucosan from Glucose in High Temperature Water”, *Chem. Eng. J.*, 153, 170-74.
- Tan, J., Li, Y., Tan, X., Wu, H., Li, H., and Yang, S., 2021, “Advances in Pretreatment of Straw Biomass for Sugar Production”, *Front. Chem.* 9(696030), 1-28.

- Tanaka, A., and Sasaki, T., 2015, “Focus on Materials Science of Topological Insulators and Superconductors”, *Sci. Technol. Adv. Mater.*, 16, 1–2.
- Tarabanko, V. E., Chernyak, M. Y., Aralova, S. V., and Kuznetsov, B. N., 2002, “Kinetics of Levulinic Acid Formation from Carbohydrates at Moderate Temperatures”, *React. Kinet. Catal. Lett.*, 75, 117-126.
- Tong, X., Ma, Y., and Li, Y., 2010, “An Efficient Catalytic Dehydration of Fructose and Sucrose to 5-hydroxymethylfurfural with Protic Ionic Liquids”, *Carbohydr. Res.*, 345, 1698-1701.
- Tuercke, T., Panic, S., and Loebbecke, S., 2009, “Microreactor Process for The Optimized Synthesis of 5-Hydroxymethylfurfural: A Promising Building Block Obtained by Catalytic Dehydration of Fructose”, *Chem. Eng. Technol.*, 32(11), 1815–1822.
- Tulaphol, S., Hossain, M. A., Rahaman, M. S., Liu, L. Y., Phung, T. K., Renneckar, S., Grisdanurak, N., Sathitsuksanoh, N., 2020, “Direct Production of Levulinic Acid in One Pot from Hemp Hurd by Dilute Acid in Ionic Liquids”, *Energy Fuels*, 34, 1764–1772.
- van der Waal, J. C. and de Jong, E., 2016, “Avantium Chemicals: The High Potential for The Levulinic Product Tree”, in *Industrial Biorenewables*, edited by Dominiguez de Maria, P., pp. 97-120.
- van Zandvoort, I., Wang, Y., Rasrendra, C. B., van Eck, E. R. H., Bruijnincx, P. C. A., Heeres, H. J., and Weckhuysen, B. M., 2013, “Formation, Molecular Structure, and Morphology of Humins in Biomass Conversion: Influence of Feedstock and Processing Conditions”, *Chem. Sus. Chem.*, 6(9), 1745-1758.
- van Putten, R. J., van der Waal, J. C., de Jong, E. D., Rasrendra, C. B., Heeres, H. J, de Vries, J. G., 2013, “Hydroxymethylfurfural, A Versatile Platform Chemical Made from Renewable Resources”, *Chem. Rev.*, 113(3), 1499–1597.
- Wang, S., Lin, H., Zhao, Y., Chen, J., and Zhou, J., 2016, “Structural Characterization and Pyrolysis Behavior of Humin by-Products from The Acid-catalyzed Conversion of C6 and C5 Carbohydrates”, *J. Anal. Appl. Pyrolysis*, 118, 259–266.
- Wang, W., Zhuang, X., Yuan, Z., and Yu, Q., 2012, “Effect of Structural Changes on Enzymatic Hydrolysis of Eucalyptus, Sweet Sorghum Bagasse, and Sugarcane Bagasse after Liquid Hot Water Pretreatment”, *Bioresources*, 7, 2469-2482.

- Weingarten, R., Beuerman, A. R., Cao, F., Luterbacher, J. S., Alonso, D. M., Dumesic, J. A., and Huber, G. W., 2014, "Selective Conversion of Cellulose to Hydroxymethylfurfural in Polar Aprotic Solvents", *Chem. Cat. Chem.*, 6, 2229–2234.
- Werpy, T., Petersen, G., Aden, A., Bozell, J., Holladay, J., White, J., and Manheim, A., 2004, "Top Value Added Chemicals from Biomass – Vol. 1: Results of Screening for Potential Candidates from Sugars and Synthesis Gas", Pacific Northwest National Laboratory, National Renewable Energy Laboratory and Department of Energy, Washington, D. C.
- Wettstein, S. G., Alonso, D. M., Chong, Y., and Dumesic, J. A., 2012, "Environmental Science Production of Levulinic Acid and Gamma-Valerolactone (GVL) from Cellulose Using GVL as A Solvent in Biphasic Systems", *Energy Environ. Sci.*, 5, 8199–8203.
- Woo, K.S., Kim, H.Y., Hwang, I.G., Lee, H.S., and Jeong, H.S., 2015, "Characteristics of The Thermal Degradation of Glucose and Maltose Solutions", *Prev. Nutr. Food. Sci.*, 20(2), 102-109.
- Xiang, Q., Lee, Y. Y., and Torget, R. W., 2004, "Kinetics of Glucose Decomposition During Dilute-Acid Hydrolysis of Lignocellulosic Biomass", *Appl. Biochem. Biotechnol.*, 113, 1127-1138.
- Xu, Z., Yang, Y., Yan, P., Xia, Z., Liu, X., and Zhang, Z. C., 2020, "Mechanistic Understanding of Humin Formation in The Conversion of Glucose and Fructose to 5-hydroxymethylfurfural in [BMIM]Cl Ionic Liquid", *RSC Advances*, 10(57), 34732–34737.
- Ya'aini, N., and Amin, N. A. S., 2013, "Catalytic Conversion of Lignocellulosic Biomass to Levulinic Acid in Ionic Liquid", *Bioresources*, 8(4), 5761-5772.
- Yan, K., And Wu, G., 2014, "Production, Properties, and Catalytic Hydrogenation of Furfural to Fuel Additives and Value-added Chemicals", *Renew. Sust. Energ. Rev.*, 38, 663-676.
- Yan, K., Jarvis, C., Gu, J., and Yan, Y., 2015, "Production and Catalytic Transformation of Levulinic Acid: A Platform for Speciality Chemicals and Fuels", *Renew. Sustain. Energy Rev.*, 51, 986–997

- Yan, L., Yang, N., Pang, H., and Liao, B., 2008, "Production of Levulinic Acid from Bagasse and Paddy Straw by Liquefaction in the Presence of Hydrochloride Acid," *Clean*, 36, 158–163.
- Yang, Z., Kang, H., Guo, Y., Zhuang, G., Bai, Z., Zhang, H., Feng, C., and Dong, Y., 2013, "Dilute-acid Conversion of Cotton Straw to Sugars and Levulinic Acid via 2-stage Hydrolysis", *Ind. Crop Prod.*, 46, 205–209.
- Yang, G., Pidko, E. A., and Hensen, E. J. M., 2012, "Mechanism of Bronsted acid-catalyzed conversion of carbohydrates", *J. Catal.*, 295, 112-132.
- Yentekakis, I. V., and Dong, F., 2020, "Grand Challenges for Catalytic Remediation in Environmental and Energy Applications toward A Cleaner and Sustainable Future", *Front. Environ. Chem.*, 1(5), 1–14.
- Yu, Z., Lu, X., Xiong, J., and Ji, N., 2019, "Transformation of Levulinic Acid to Valeric Biofuels: A Review on Heterogeneous Bifunctional Catalytic Systems", *Chem. Sus. Chem.*, 12, 3915–3930.
- Yu, Z., Meng, F., Wang, Y., Sun, Z., Liu, Y., Shi, C., Wang, W., and Wang, A., 2020, "Catalytic Transfer Hydrogenation of Levulinic Acid to γ -valerolactone over Ni_3P - CePO_4 Catalysts", *Ind. Eng. Chem. Res.*, 59, 7416–7425.
- Yuan, Z., Long, J., Xia, Y., Zhang, X., and Wang, T., 2016, "Production of Levulinic Acid from *Pennisetum alopecuroides* in the Presence of an Acid Catalyst", *BioResources*, 11, 3511–3523.
- Zeng, W., Cheng, D., Zhang, H., Chen, F., and Zhan, X., 2010, "Dehydration of Glucose to Levulinic Acid over MFI-type Zeolite in Subcritical Water at Moderate Conditions", *React. Kinet. Mech. Catal.*, 100, 377-384.
- Zheng, X., Zhi, Z., Gu, X., Li, X., Zhang, R., and Lu, X., 2017, "Kinetic Study of Levulinic Acid Production from Corn Stalk at Mild Temperature Using FeCl_3 As Catalyst", *Fuel*, 187, 261–267.
- Zhi, Z., Li, N., Qiao, Y., Zheng, X., Wang, H., and Lu, X., 2015, "Kinetic Study of Levulinic Acid Production from Corn Stalk at Relatively High Temperature Using FeCl_3 As Catalyst: A Simplified Model Evaluated", *Ind. Crop Prod.*, 76, 672–680.
- Zhou, C., Zhao, J., Elgasim, A., Yagoub, A., and Ma, H., 2017, "Conversion of Glucose into 5-Hydroxymethylfurfural in Different Solvents and Catalysts: Reaction Kinetics and Mechanism", *Egypt. J. Pet.*, 26, 477-4.