

List of Research Publications

Research Publications

Published:

1. **Devarapaga Madhu**, Bhaskar Singh and Yogesh C. Sharma. Studies on application of fish waste for synthesis of high quality biodiesel. RSC Adv., 2014, 4, 31462
2. Yogesh C. Sharma, Bhaskar Singh, **Devarapaga Madhu**, Yun Liu, Zahira Yaakob. Fast Synthesis of High Quality Biodiesel from 'Waste Fish Oil' by Single Step Transesterification. Biofuel Research Journal 3 (2014) 78-80.
- 3 SB Chavan, RR Kumbhar, **D Madhu**, B Singh, YC Sharma RSC Advances 5 (78), 63596-63604. Synthesis of biodiesel from Jatropha curcas oil using waste eggshell and study of its fuel properties. RSC Advances 5 (78), 63596-63604.
- 4 **D Madhu**, SB Chavan, V Singh, B Singh, YC Sharma. An economically viable synthesis of biodiesel from a crude Millettia pinnata oil of Jharkhand, India as feedstock and crab shell derived catalyst. Bioresource technology 214, 210-217.

Communicated:

5. **Devarapaga Madhu**, Reena Singh, Yogesh C. Sharma. Synthesis and optimization of biodiesel from pongamia pinnata oil using β -TCP and effect of co-solvent on biodiesel yield. Communicated in ACS sustainable Chemistry and Engineering.
6. **Devarapaga Madhu**, Reena Singh, Rajan Arora, Yogesh C. Sharma., Low cost biodiesel production from waste fish oil using calcium oxide (CaO) derived from waste crab shells as an efficient catalyst. Communicated in ACS Energy and Fuels.
7. Synthesis of high quality biodiesel using feedstock and catalyst derived from fish wastes. Devarapaga Madhu, Sharma, Yogesh, Arora, Rajan, Sahani, Shalini, Singh, Veena. **Journal of Agricultural and Food Chemistry**.
8. Synthesis of a reusable novel catalyst (β -tri calcium phosphate) for biodiesel production from a common. **Deverapaga, Madhu**; Miss Meena Yadav. Energy Conversion and Management

Under preparation:

9. Synthesis, characterization, optimization of biodiesel using calcium oxide derived from waste coral sand. (**Tentative**)

List of Research Publications

Symposium and Conferences

1. National Symposium on Nanomaterials & Sustainable Synthetic Strategies, **March 21st-22nd, 2015**, Department of Chemistry, BHU, Varanasi, India, **(Participation)**.
2. National seminar on Environmental concern and Sustainable Development, **2nd-4th March 2012**, Institute of Environment & Sustainable Development, BHU, Varanasi, India, **(Oral Presentation)**.
3. 2nd Second International Conference on Materials Science and Technology (ICMST-2016), **June 5th-8th, 2016**, Department of Physics, ST Thomas College Kottayam, India, **(Oral Presentation)**.

References

- Adewale, P., Dumont, M.-J., Ngadi, M. "Enzyme-catalyzed synthesis and kinetics of ultrasonic-assisted biodiesel production from waste tallow," *Ultrasonics sonochemistry*, **27** (2015) 1-9.
- Agarwal, A.K., Rajamanoharan, K. "Experimental investigations of performance and emissions of Karanja oil and its blends in a single cylinder agricultural diesel engine," *Applied Energy*, **86**(1) (2009) 106-112.
- Agrawal, S., Singh, B., Sharma, Y.C. "Exoskeleton of a mollusk (*Pila globosa*) as a heterogeneous catalyst for synthesis of biodiesel using used frying oil," *Industrial & Engineering Chemistry Research*, **51**(37) (2012) 11875-11880.
- Aguilar-Garnica, E., Rodríguez-Palomera, F., García-Sandoval, J.P., Escalante, F.M. "Dynamical modeling for biodiesel production from grease trap wastes," *Chemical Engineering Science*, **117** (2014) 396-406.
- Al-Zuhair, S., Hussein, A., Al-Marzouqi, A.H., Hashim, I. "Continuous production of biodiesel from fat extracted from lamb meat in supercritical CO₂ media," *Biochemical Engineering Journal*, **60** (2012) 106-110.
- Ali, R. "Biodiesel a renewable alternate clean and environment friendly fuel for petrodiesel engines: a review," *International Journal of Engineering Science and Technology*, **3**(10) (2011) 7707-7713.
- Altın, R., Cetinkaya, S., Yücesu, H.S. "The potential of using vegetable oil fuels as fuel for diesel engines," *Energy conversion and management*, **42**(5) (2001) 529-538.
- Aniya, V.K., Muktham, R.K., Alka, K., Satyavathi, B. "Modeling and simulation of batch kinetics of non-edible karanja oil for biodiesel production: A mass transfer study," *Fuel*, **161** (2015) 137-145.
- Arruda, L.F.d., Borghesi, R., Oetterer, M. "Use of fish waste as silage: a review," *Brazilian Archives of Biology and Technology*, **50**(5) (2007) 879-886.

- Aryee, A.N., Van de Voort, F.R., Simpson, B.K. "FTIR determination of free fatty acids in fish oils intended for biodiesel production," *Process Biochemistry*, **44**(4) (2009) 401-405.
- Babu, N.S., Sree, R., Prasad, P.S., Lingaiah, N. "Room-temperature transesterification of edible and nonedible oils using a heterogeneous strong basic Mg/La catalyst," *Energy & Fuels*, **22**(3) (2008) 1965-1971.
- Bai, F., Anderson, W., Moo-Young, M. "Ethanol fermentation technologies from sugar and starch feedstocks," *Biotechnology advances*, **26**(1) (2008) 89-105.
- Balat, M. "Potential alternatives to edible oils for biodiesel production—A review of current work," *Energy Conversion and Management*, **52**(2) (2011) 1479-1492.
- Barbir, F., Veziroğlu, T., Plass, H. "Environmental damage due to fossil fuels use," *International journal of hydrogen energy*, **15**(10) (1990) 739-749.
- Bashiri, H., Pourbeiram, N. "Biodiesel production through transesterification of soybean oil: A kinetic Monte Carlo study," *Journal of Molecular Liquids*, **223** (2016) 10-15.
- Baskar, G., Soumiya, S. "Production of biodiesel from castor oil using iron (II) doped zinc oxide nanocatalyst," *Renewable Energy* (2016).
- Behçet, R. "Performance and emission study of waste anchovy fish biodiesel in a diesel engine," *Fuel Processing Technology*, **92**(6) (2011) 1187-1194.
- Bergamasco, J., de Araujo, M.V., de Vasconcellos, A., Luizon Filho, R.A., Hatanaka, R.R., Giotto, M.V., Aranda, D.A., Nery, J.G. "Enzymatic transesterification of soybean oil with ethanol using lipases immobilized on highly crystalline PVA microspheres," *biomass and bioenergy*, **59** (2013) 218-233.
- Bhutada, P.R., Jadhav, A.J., Pinjari, D.V., Nemade, P.R., Jain, R.D. "Solvent assisted extraction of oil from *Moringa oleifera* Lam. seeds," *Industrial Crops and Products*, **82** (2016) 74-80.
- Bilgen, S. "Structure and environmental impact of global energy consumption," *Renewable and Sustainable Energy Reviews*, **38** (2014) 890-902.

- Blythe, N.X. 1996. Fish oil as an alternative fuel for internal combustion engines. American Society of Mechanical Engineers, New York, NY (United States).
- Bobade, S., Khyade, V. "Detail study on the Properties of Pongamia Pinnata (Karanja) for the Production of Biofuel," *Research Journal of Chemical Sciences ISSN*, **2231** (2012) 606X.
- Boey, P.-L., Maniam, G.P., Hamid, S.A. "Biodiesel production via transesterification of palm olein using waste mud crab (*Scylla serrata*) shell as a heterogeneous catalyst," *Bioresource technology*, **100**(24) (2009) 6362-6368.
- Boey, P.-L., Maniam, G.P., Hamid, S.A. "Performance of calcium oxide as a heterogeneous catalyst in biodiesel production: a review," *Chemical Engineering Journal*, **168**(1) (2011a) 15-22.
- Boey, P.-L., Maniam, G.P., Hamid, S.A., Ali, D.M.H. "Crab and cockle shells as catalysts for the preparation of methyl esters from low free fatty acid chicken fat," *Journal of the American Oil Chemists' Society*, **88**(2) (2011b) 283-288.
- Boutinguiza, M., Pou, J., Comesaña, R., Lusquiños, F., De Carlos, A., León, B. "Biological hydroxyapatite obtained from fish bones," *Materials Science and Engineering: C*, **32**(3) (2012) 478-486.
- Breucker, C., Jordan, V., Nitsche, M., Gutsche, B. "Olechemie–Chemieprodukte auf der Basis nachwachsender Rohstoffe," *Chemie Ingenieur Technik*, **67**(4) (1995) 430-440.
- Brown, J.H., Burger, J.R., Burnside, W.R., Chang, M., Davidson, A.D., Fristoe, T.S., Hamilton, M.J., Hammond, S.T., Kodric-Brown, A., Mercado-Silva, N. "Macroecology meets macroeconomics: Resource scarcity and global sustainability," *Ecological engineering*, **65** (2014) 24-32.
- Cai, Z.-Z., Wang, Y., Teng, Y.-L., Chong, K.-M., Wang, J.-W., Zhang, J.-W., Yang, D.-P. "A two-step biodiesel production process from waste cooking oil via recycling crude glycerol esterification catalyzed by alkali catalyst," *Fuel Processing Technology*, **137** (2015) 186-193.

- Canakci, M. "Combustion characteristics of a turbocharged DI compression ignition engine fueled with petroleum diesel fuels and biodiesel," *Bioresource technology*, **98**(6) (2007) 1167-1175.
- Canakci, M., Van Gerpen, J. "Biodiesel production from oils and fats with high free fatty acids," *Transactions-American Society of Agricultural Engineers*, **44**(6) (2001) 1429-1436.
- Candeia, R., Silva, M., Carvalho Filho, J., Brasilino, M., Bicudo, T., Santos, I., Souza, A. "Influence of soybean biodiesel content on basic properties of biodiesel–diesel blends," *Fuel*, **88**(4) (2009) 738-743.
- Cao, H., Zhang, Z., Wu, X., Miao, X. "Direct biodiesel production from wet microalgae biomass of *Chlorella pyrenoidosa* through in situ transesterification," *BioMed research international*, **2013** (2013).
- Cazarolli, J.C., Guzatto, R., Samios, D., Peralba, M.d.C.R., de Siqueira Cavalcanti, E.H., Bento, F.M. "Susceptibility of linseed, soybean, and olive biodiesel to growth of the deteriorogenic fungus *Pseudallescheria boydii*," *International Biodeterioration & Biodegradation*, **95** (2014) 364-372.
- Chakraborty, R., Bepari, S., Banerjee, A. "Application of calcined waste fish (*Labeo rohita*) scale as low-cost heterogeneous catalyst for biodiesel synthesis," *Bioresource technology*, **102**(3) (2011) 3610-3618.
- Chakraborty, R., Das, S., Bhattacharjee, S.K. "Optimization of biodiesel production from Indian mustard oil by biological tri-calcium phosphate catalyst derived from turkey bone ash," *Clean Technologies and Environmental Policy*, **17**(2) (2015) 455-463.
- Chang, A.C.-C., Louh, R., Wong, D., Tseng, J., Lee, Y. "Hydrogen production by aqueous-phase biomass reforming over carbon textile supported Pt–Ru bimetallic catalysts," *international journal of hydrogen energy*, **36**(14) (2011) 8794-8799.
- Chen, B., Zhang, Z., Zhang, J., Lin, Q., Jiang, D. "Fabrication and mechanical properties of β -TCP pieces by gel-casting method," *Materials Science and Engineering: C*, **28**(7) (2008) 1052-1056.

- Chen, H., Peng, B., Wang, D., Wang, J. "Biodiesel production by the transesterification of cottonseed oil by solid acid catalysts," *Frontiers of Chemical Engineering in China*, **1**(1) (2007) 11-15.
- Cho, K., Lee, C.-H., Ko, K., Lee, Y.-J., Kim, K.-N., Kim, M.-K., Chung, Y.-H., Kim, D., Yeo, I.-K., Oda, T. "Use of phenol-induced oxidative stress acclimation to stimulate cell growth and biodiesel production by the oceanic microalga *Dunaliella salina*," *Algal Research*, **17** (2016) 61-66.
- Chou, J., Ben-Nissan, B., Choi, A., Wuhrer, R., Green, D. "Conversion of coral sand to calcium phosphate for biomedical applications," *Journal of the Australasian Ceramic Society*, **43**(1) (2007) 44-48.
- Clark, S., Wagner, L., Schrock, M., Piennaar, P. "Methyl and ethyl soybean esters as renewable fuels for diesel engines," *Journal of the American Oil Chemists Society*, **61**(10) (1984) 1632-1638.
- Collins, C.D. "Implementing phytoremediation of petroleum hydrocarbons," *Phytoremediation: methods and reviews* (2007) 99-108.
- Correia, L.M., Saboya, R.M.A., de Sousa Campelo, N., Cecilia, J.A., Rodríguez-Castellón, E., Cavalcante, C.L., Vieira, R.S. "Characterization of calcium oxide catalysts from natural sources and their application in the transesterification of sunflower oil," *Bioresource technology*, **151** (2014) 207-213.
- Corro, G., Sánchez, N., Pal, U., Bañuelos, F. "Biodiesel production from waste frying oil using waste animal bone and solar heat," *Waste Management*, **47** (2016) 105-113.
- Dai, J.-Y., Li, D.-Y., Zhao, Y.-C., Xiu, Z.-L. "Statistical optimization for biodiesel production from soybean oil in a microchannel reactor," *Industrial & Engineering Chemistry Research*, **53**(22) (2014) 9325-9330.
- Dawodu, F., Ayodele, O., Bolanle-Ojo, T. "Biodiesel production from *Sesamum indicum* L. seed oil: An optimization study," *Egyptian Journal of Petroleum*, **23**(2) (2014) 191-199.

- de Almeida, V.F., García-Moreno, P.J., Guadix, A., Guadix, E.M. "Biodiesel production from mixtures of waste fish oil, palm oil and waste frying oil: optimization of fuel properties," *Fuel Processing Technology*, **133** (2015) 152-160.
- Delfort, B., Hillion, G., Le Pennec, D., Lendresse, C. 2006. Process for transesterification of vegetable oils or animal oils by means of heterogeneous catalysts based on zinc or bismuth, titanium and aluminium, Google Patents.
- Demirbas, A. "Biodiesel production from vegetable oils by supercritical methanol," *Journal of Scientific and Industrial Research*, **64**(11) (2005) 858.
- Demirbas, A. "Biodiesel production via non-catalytic SCF method and biodiesel fuel characteristics," *Energy conversion and Management*, **47**(15) (2006) 2271-2282.
- Demirbas, A. "Importance of biodiesel as transportation fuel," *Energy policy*, **35**(9) (2007) 4661-4670.
- Demirbaş, A. "Biodegradability of biodiesel and petrodiesel fuels," *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects*, **31**(2) (2008) 169-174.
- Devi, B.P., Reddy, T.V.K., Lakshmi, K.V., Prasad, R. "A green recyclable SO₃H-carbon catalyst derived from glycerol for the production of biodiesel from FFA-containing karanja (*Pongamia glabra*) oil in a single step," *Bioresource technology*, **153** (2014) 370-373.
- Di Serio, M., Tesser, R., Pengmei, L., Santacesaria, E. "Heterogeneous catalysts for biodiesel production," *Energy & Fuels*, **22**(1) (2007) 207-217.
- Dixit, S., Rehman, A. "Linseed oil as a potential resource for bio-diesel: A review," *Renewable and Sustainable Energy Reviews*, **16**(7) (2012) 4415-4421.
- Dorado, M., Ballesteros, E., Arnal, J., Gomez, J., Lopez, F. "Exhaust emissions from a Diesel engine fueled with transesterified waste olive oil☆," *Fuel*, **82**(11) (2003a) 1311-1315.
- Dorado, M., Ballesteros, E., Arnal, J., Gomez, J., López Giménez, F. "Testing waste olive oil methyl ester as a fuel in a diesel engine," *Energy & Fuels*, **17**(6) (2003b) 1560-1565.

- Dossin, T.F., Reyniers, M.-F., Berger, R.J., Marin, G.B. "Simulation of heterogeneously MgO-catalyzed transesterification for fine-chemical and biodiesel industrial production," *Applied Catalysis B: Environmental*, **67**(1) (2006) 136-148.
- Dwivedi, G., Jain, S., Sharma, M.P. "Pongamia as a source of biodiesel in India," *Smart grid and Renewable Energy*, **2**(3) (2011) 184.
- Einloft, S., Magalhães, T.O., Donato, A., Dullius, J., Ligabue, R. "Biodiesel from rice bran oil: transesterification by tin compounds," *Energy & Fuels*, **22**(1) (2007) 671-674.
- Ejikeme, P., Anyaogu, I., Ejikeme, C., Nwafor, N., Egbuonu, C., Ukogu, K., Ibemesi, J. "Catalysis in biodiesel production by transesterification processes-an insight," *Journal of Chemistry*, **7**(4) (2010) 1120-1132.
- El Boulifi, N., Bouaid, A., Martinez, M., Aracil, J. "Optimization and oxidative stability of biodiesel production from rice bran oil," *Renewable Energy*, **53** (2013) 141-147.
- Encinar, J.M., Pardal, A., Sánchez, N. "An improvement to the transesterification process by the use of co-solvents to produce biodiesel," *Fuel*, **166** (2016) 51-58.
- Fallahipanah, M., Ghazavi, M., Hashemi, M., Shahmirzaei, H. 2011. Comparison of the performance of Biodiesel, Diesel, and their compound in Diesel air standard irreversible cycles. *Proceedings of the 2011 International Conference on Environment Agriculture Engineering (IPCBEA), Chengdu, China*. pp. 29-31.
- Farooq, M., Ramli, A., Naeem, A. "Biodiesel production from low FFA waste cooking oil using heterogeneous catalyst derived from chicken bones," *Renewable Energy*, **76** (2015) 362-368.
- Ferrero, G.O., Almeida, M.F., Alvim-Ferraz, M.C., Dias, J.M. "Glycerol-enriched heterogeneous catalyst for biodiesel production from soybean oil and waste frying oil," *Energy Conversion and Management*, **89** (2015) 665-671.
- Feyzi, M., Hassankhani, A., Rafiee, H.R. "Preparation and characterization of Cs/Al/Fe 3 O 4 nanocatalysts for biodiesel production," *Energy Conversion and Management*, **71** (2013) 62-68.

- Filgueiras, M.R.T., La Torre, G., Hench, L.L. "Solution effects on the surface reactions of three bioactive glass compositions," *Journal of biomedical materials research*, **27**(12) (1993) 1485-1493.
- Freedman, B., Butterfield, R.O., Pryde, E.H. "Transesterification kinetics of soybean oil 1," *Journal of the American Oil Chemists' Society*, **63**(10) (1986) 1375-1380.
- Freedman, B., Pryde, E., Mounts, T. "Variables affecting the yields of fatty esters from transesterified vegetable oils," *Journal of the American Oil Chemists Society*, **61**(10) (1984) 1638-1643.
- Furuta, S., Matsuhashi, H., Arata, K. "Biodiesel fuel production with solid amorphous-zirconia catalysis in fixed bed reactor," *Biomass and Bioenergy*, **30**(10) (2006) 870-873.
- Gaanty Pragas, M., Boey, P.L., Shafida, A.H. "Biodiesel from adsorbed waste oil on spent bleaching clay using CaO as a heterogeneous catalyst," *European Journal of Scientific Research*, **33**(2) (2009) 347-357.
- García-Moreno, P.J., Khanum, M., Guadix, A., Guadix, E.M. "Optimization of biodiesel production from waste fish oil," *Renewable Energy*, **68** (2014) 618-624.
- Ghadge, S.V., Raheman, H. "Process optimization for biodiesel production from mahua (*Madhuca indica*) oil using response surface methodology," *Bioresource technology*, **97**(3) (2006) 379-384.
- Godiganur, S., Murthy, C.S., Reddy, R.P. "Performance and emission characteristics of a Kirloskar HA394 diesel engine operated on fish oil methyl esters," *Renewable Energy*, **35**(2) (2010) 355-359.
- Goembira, F., Saka, S. "Advanced supercritical Methyl acetate method for biodiesel production from *Pongamia pinnata* oil," *Renewable Energy*, **83** (2015) 1245-1249.
- Goodrum, J.W., Geller, D.P. "Influence of fatty acid methyl esters from hydroxylated vegetable oils on diesel fuel lubricity," *Bioresource Technology*, **96**(7) (2005) 851-855.

- Granados, M.L., Poves, M.Z., Alonso, D.M., Mariscal, R., Galisteo, F.C., Moreno-Tost, R., Santamaría, J., Fierro, J. "Biodiesel from sunflower oil by using activated calcium oxide," *Applied Catalysis B: Environmental*, **73**(3) (2007) 317-326.
- Guan, G., Kusakabe, K., Yamasaki, S. "Tri-potassium phosphate as a solid catalyst for biodiesel production from waste cooking oil," *Fuel Processing Technology*, **90**(4) (2009) 520-524.
- Gurunathan, B., Ravi, A. "Process optimization and kinetics of biodiesel production from neem oil using copper doped zinc oxide heterogeneous nanocatalyst," *Bioresource technology*, **190** (2015) 424-428.
- Gustavsson, J., Cederberg, C., Sonesson, U., Van Otterdijk, R., Meybeck, A. "Global food losses and food waste," *Food and Agriculture Organization of the United Nations, Rom* (2011).
- Hameed, B.H., Lai, L., Chin, L. "Production of biodiesel from palm oil (*Elaeis guineensis*) using heterogeneous catalyst: an optimized process," *Fuel Processing Technology*, **90**(4) (2009) 606-610.
- Hassan, S.Z., Vinjamur, M. "Analysis of sensitivity of equilibrium constant to reaction conditions for esterification of fatty acids with alcohols," *Industrial & Engineering Chemistry Research*, **52**(3) (2013) 1205-1215.
- Hassen-Trabelsi, A.B., Kraiem, T., Naoui, S., Belayouni, H. "Pyrolysis of waste animal fats in a fixed-bed reactor: production and characterization of bio-oil and bio-char," *Waste management*, **34**(1) (2014) 210-218.
- Hayyan, M., Mjalli, F.S., Hashim, M.A., AlNashef, I.M. "A novel technique for separating glycerine from palm oil-based biodiesel using ionic liquids," *Fuel Processing Technology*, **91**(1) (2010) 116-120.
- Helwani, Z., Othman, M., Aziz, N., Fernando, W., Kim, J. "Technologies for production of biodiesel focusing on green catalytic techniques: a review," *Fuel Processing Technology*, **90**(12) (2009) 1502-1514.
- Hoffmann, A.A., Sgro, C.M. "Climate change and evolutionary adaptation," *Nature*, **470**(7335) (2011) 479-485.

- Holt, R. "A responsible energy future," *Science*, **285**(5428) (1999) 662-662.
- Höök, M., Tang, X. "Depletion of fossil fuels and anthropogenic climate change A review," *Energy Policy*, **52** (2013) 797-809.
- Hossain, A., Mazen, M. "Effects of catalyst types and concentrations on biodiesel production from waste soybean oil biomass as renewable energy and environmental recycling process," *Australian journal of crop science*, **4**(7) (2010) 550.
- İlkılıç, C., Aydın, S., Behçet, R., Aydın, H. "Biodiesel from safflower oil and its application in a diesel engine," *Fuel processing technology*, **92**(3) (2011) 356-362.
- Indarti, E. "Hydrated calcined *Cyrtopleura costata* seashells as an effective solid catalyst for microwave-assisted preparation of palm oil biodiesel," *Energy Conversion and Management*, **117** (2016) 319-325.
- Jitputti, J., Kitiyanan, B., Rangsunvigit, P., Bunyakiat, K., Attanatho, L., Jenvanitpanjakul, P. "Transesterification of crude palm kernel oil and crude coconut oil by different solid catalysts," *Chemical Engineering Journal*, **116**(1) (2006) 61-66.
- Joshi, G., Rawat, D.S., Lamba, B.Y., Bisht, K.K., Kumar, P., Kumar, N., Kumar, S. "Transesterification of *Jatropha* and *Karanja* oils by using waste egg shell derived calcium based mixed metal oxides," *Energy Conversion and Management*, **96** (2015) 258-267.
- Karmee, S.K., Chadha, A. "Preparation of biodiesel from crude oil of *Pongamia pinnata*," *Bioresource technology*, **96**(13) (2005) 1425-1429.
- Kartika, I.A., Yani, M., Ariono, D., Evon, P., Rigal, L. "Biodiesel production from *jatropha* seeds: solvent extraction and in situ transesterification in a single step," *Fuel*, **106** (2013) 111-117.
- Kaur, N., Ali, A. "Kinetics and reusability of Zr/CaO as heterogeneous catalyst for the ethanolysis and methanolysis of *Jatropha crucas* oil," *Fuel Processing Technology*, **119** (2014) 173-184.

- Knothe, G., Sharp, C.A., Ryan, T.W. "Exhaust emissions of biodiesel, petrodiesel, neat methyl esters, and alkanes in a new technology engine," *Energy & Fuels*, **20**(1) (2006) 403-408.
- Knothe, G., Steidley, K.R. "Kinematic viscosity of biodiesel fuel components and related compounds. Influence of compound structure and comparison to petrodiesel fuel components," *Fuel*, **84**(9) (2005a) 1059-1065.
- Knothe, G., Steidley, K.R. "Lubricity of components of biodiesel and petrodiesel. The origin of biodiesel lubricity," *Energy & fuels*, **19**(3) (2005b) 1192-1200.
- Kouzu, M., Kajita, A., Fujimori, A. "Catalytic activity of calcined scallop shell for rapeseed oil transesterification to produce biodiesel," *Fuel*, **182** (2016) 220-226.
- Kouzu, M., Kasuno, T., Tajika, M., Sugimoto, Y., Yamanaka, S., Hidaka, J. "Calcium oxide as a solid base catalyst for transesterification of soybean oil and its application to biodiesel production," *Fuel*, **87**(12) (2008) 2798-2806.
- Kouzu, M., Yamanaka, S.-y., Hidaka, J.-s., Tsunomori, M. "Heterogeneous catalysis of calcium oxide used for transesterification of soybean oil with refluxing methanol," *Applied Catalysis A: General*, **355**(1) (2009) 94-99.
- Kulkarni, M.G., Dalai, A.K. "Waste cooking oil an economical source for biodiesel: a review," *Industrial & engineering chemistry research*, **45**(9) (2006) 2901-2913.
- Kumar, R., Kumar, G.R., Chandrashekar, N. "Microwave assisted alkali-catalyzed transesterification of Pongamia pinnata seed oil for biodiesel production," *Bioresource technology*, **102**(11) (2011) 6617-6620.
- Kumari, V., Shah, S., Gupta, M.N. "Preparation of biodiesel by lipase-catalyzed transesterification of high free fatty acid containing oil from *Madhuca indica*," *Energy & Fuels*, **21**(1) (2007) 368-372.
- Kuo, T.-C., Shaw, J.-F., Lee, G.-C. "Conversion of crude *Jatropha curcas* seed oil into biodiesel using liquid recombinant *Candida rugosa* lipase isozymes," *Bioresource technology*, **192** (2015) 54-59.
- Kusdiana, D., Saka, S. "Kinetics of transesterification in rapeseed oil to biodiesel fuel as treated in supercritical methanol," *Fuel*, **80**(5) (2001) 693-698.

- Kusmiyati, T.R.P., Wulandari, T. "WASTE FISH OIL BIODIESEL PRODUCTION AND ITS PERFORMACE IN DIESEL ENGINE," (2006).
- Lam, M.K., Lee, K.T., Mohamed, A.R. "Sulfated tin oxide as solid superacid catalyst for transesterification of waste cooking oil: an optimization study," *Applied Catalysis B: Environmental*, **93**(1) (2009) 134-139.
- Langeveld, H., Sanders, J., Meeusen, M. 2012. *The biobased economy: biofuels, materials, and chemicals in the post-oil era*. Earthscan.
- Lee, H.V., Juan, J.C., Abdullah, N.F.B., Taufiq-Yap, Y.H. "Heterogeneous base catalysts for edible palm and non-edible Jatropha-based biodiesel production," *Chemistry Central Journal*, **8**(1) (2014) 1.
- Leung, D., Guo, Y. "Transesterification of neat and used frying oil: optimization for biodiesel production," *Fuel Processing Technology*, **87**(10) (2006) 883-890.
- Likozar, B., Levec, J. "Transesterification of canola, palm, peanut, soybean and sunflower oil with methanol, ethanol, isopropanol, butanol and tert-butanol to biodiesel: Modelling of chemical equilibrium, reaction kinetics and mass transfer based on fatty acid composition," *Applied Energy*, **123** (2014) 108-120.
- Lin, C.-Y., Li, R.-J. "Engine performance and emission characteristics of marine fish-oil biodiesel produced from the discarded parts of marine fish," *Fuel Processing Technology*, **90**(7) (2009a) 883-888.
- Lin, C.-Y., Li, R.-J. "Fuel properties of biodiesel produced from the crude fish oil from the soapstock of marine fish," *Fuel Processing Technology*, **90**(1) (2009b) 130-136.
- Liu, X., He, H., Wang, Y., Zhu, S. "Transesterification of soybean oil to biodiesel using SrO as a solid base catalyst," *Catalysis Communications*, **8**(7) (2007) 1107-1111.
- Lopez, D.E., Goodwin, J.G., Bruce, D.A., Lotero, E. "Transesterification of triacetin with methanol on solid acid and base catalysts," *Applied Catalysis A: General*, **295**(2) (2005) 97-105.

- Lotero, E., Liu, Y., Lopez, D.E., Suwannakarn, K., Bruce, D.A., Goodwin, J.G. "Synthesis of biodiesel via acid catalysis," *Industrial & engineering chemistry research*, **44**(14) (2005) 5353-5363.
- Lu, Q., Yang, X.-l., Zhu, X.-f. "Analysis on chemical and physical properties of bio-oil pyrolyzed from rice husk," *Journal of Analytical and Applied Pyrolysis*, **82**(2) (2008) 191-198.
- Luu, P.D., Truong, H.T., Van Luu, B., Pham, L.N., Imamura, K., Takenaka, N., Maeda, Y. "Production of biodiesel from Vietnamese *Jatropha curcas* oil by a co-solvent method," *Bioresource technology*, **173** (2014) 309-316.
- Ma, F., Hanna, M.A. "Biodiesel production: a review," *Bioresource technology*, **70**(1) (1999) 1-15.
- MacLeod, R., Assessment, R.V.A.C. "Waste vegetable oil survey report," *Science enterprise Algoma, USA* (2009).
- Madhu, D., Chavan, S.B., Singh, V., Singh, B., Sharma, Y.C. "An economically viable synthesis of biodiesel from a crude *Milletia pinnata* oil of Jharkhand, India as feedstock and crab shell derived catalyst," *Bioresource technology*, **214** (2016) 210-217.
- Madhu, D., Singh, B., Sharma, Y.C. "Studies on application of fish waste for synthesis of high quality biodiesel," *RSC Advances*, **4**(59) (2014) 31462-31468.
- Mansir, N., Taufiq-Yap, Y.H., Rashid, U., Lokman, I.M. "Investigation of heterogeneous solid acid catalyst performance on low grade feedstocks for biodiesel production: A review," *Energy Conversion and Management* (2016).
- Maran, J.P., Priya, B. "Modeling of ultrasound assisted intensification of biodiesel production from neem (*Azadirachta indica*) oil using response surface methodology and artificial neural network," *Fuel*, **143** (2015) 262-267.
- Markou, G., Angelidaki, I., Georgakakis, D. "Carbohydrate-enriched cyanobacterial biomass as feedstock for bio-methane production through anaerobic digestion," *Fuel*, **111** (2013) 872-879.

- Mathimani, T., Nair, B.B. "Evaluation of microalga for biodiesel using lipid and fatty acid as a marker—A central composite design approach," *Journal of the Energy Institute* (2015).
- Mazanov, S.V., Gabitova, A.R., Usmanov, R.A., Gumerov, F.M., Labidi, S., Amar, M.B., Passarello, J.-P., Kanaev, A., Volle, F., Le Neindre, B. "Continuous production of biodiesel from rapeseed oil by ultrasonic assist transesterification in supercritical ethanol," *The Journal of Supercritical Fluids*, **118** (2016) 107-118.
- Meher, L., Sagar, D.V., Naik, S. "Technical aspects of biodiesel production by transesterification—a review," *Renewable and sustainable energy reviews*, **10**(3) (2006) 248-268.
- Milan, D., Savin, L.D., Radoslav, D., SIMIKI, M.D. "Effects of fossil diesel and biodiesel blends on the performances and emissions of agricultural tractor engines," *Thermal Science*, **17**(1) (2013) 263-278.
- Mjalli, F.S., Hussain, M.A. "Approximate predictive versus self-tuning adaptive control strategies of biodiesel reactors," *Industrial & Engineering Chemistry Research*, **48**(24) (2009) 11034-11047.
- Morshed, M., Ferdous, K., Khan, M.R., Mazumder, M., Islam, M., Uddin, M.T. "Rubber seed oil as a potential source for biodiesel production in Bangladesh," *Fuel*, **90**(10) (2011) 2981-2986.
- Moser, B.R. "Preparation of fatty acid methyl esters from hazelnut, high-oleic peanut and walnut oils and evaluation as biodiesel," *Fuel*, **92**(1) (2012) 231-238.
- Mueller, C.J., Boehman, A.L., Martin, G.C. "An experimental investigation of the origin of increased NO_x emissions when fueling a heavy-duty compression-ignition engine with soy biodiesel," *SAE International Journal of Fuels and Lubricants*, **2**(2009-01-1792) (2009) 789-816.
- Muppaneni, T., Reddy, H.K., Patil, P.D., Dailey, P., Aday, C., Deng, S. "Ethanolysis of camelina oil under supercritical condition with hexane as a co-solvent," *Applied Energy*, **94** (2012) 84-88.

- Nabi, M.N., Rahman, M.M., Akhter, M.S. "Biodiesel from cotton seed oil and its effect on engine performance and exhaust emissions," *Applied Thermal Engineering*, **29**(11) (2009) 2265-2270.
- Naik, M., Meher, L., Naik, S., Das, L. "Production of biodiesel from high free fatty acid Karanja (*Pongamia pinnata*) oil," *Biomass and Bioenergy*, **32**(4) (2008) 354-357.
- Nakatani, N., Takamori, H., Takeda, K., Sakugawa, H. "Transesterification of soybean oil using combusted oyster shell waste as a catalyst," *Bioresource Technology*, **100**(3) (2009) 1510-1513.
- Nitièma-Yefanova, S., Coniglio, L., Schneider, R., Nébié, R.H., Bonzi-Coulibaly, Y.L. "Ethyl biodiesel production from non-edible oils of *Balanites aegyptiaca*, *Azadirachta indica*, and *Jatropha curcas* seeds–Laboratory scale development," *Renewable Energy*, **96** (2016) 881-890.
- Okitsu, K., Sadanaga, Y., Takenaka, N., Maeda, Y., Bandow, H. "A new co-solvent method for the green production of biodiesel fuel–Optimization and practical application," *Fuel*, **103** (2013) 742-748.
- Öner, C., Altun, Ş. "Biodiesel production from inedible animal tallow and an experimental investigation of its use as alternative fuel in a direct injection diesel engine," *Applied Energy*, **86**(10) (2009) 2114-2120.
- Onoji, S.E., Iyuke, S.E., Igbafe, A.I., Nkazi, D.B. "Rubber seed oil: A potential renewable source of biodiesel for sustainable development in sub-Saharan Africa," *Energy Conversion and Management*, **110** (2016) 125-134.
- Ortiz-Martínez, V., Salar-García, M., Palacios-Nereo, F., Olivares-Carrillo, P., Quesada-Medina, J., de los Ríos, A., Hernández-Fernández, F. "In-depth study of the transesterification reaction of *Pongamia pinnata* oil for biodiesel production using catalyst-free supercritical methanol process," *The Journal of Supercritical Fluids*, **113** (2016) 23-30.
- Patil, P.D., Gude, V.G., Mannarswamy, A., Deng, S., Cooke, P., Munson-McGee, S., Rhodes, I., Lammers, P., Nirmalakhandan, N. "Optimization of direct conversion

- of wet algae to biodiesel under supercritical methanol conditions," *Bioresource Technology*, **102**(1) (2011) 118-122.
- Peterson, C.L., Hustrulid, T. "Carbon cycle for rapeseed oil biodiesel fuels," *Biomass and Bioenergy*, **14**(2) (1998) 91-101.
- Porwal, J., Bangwal, D., Garg, M., Kaul, S., Harvey, A., Lee, J., Kasim, F., Eterigho, E. "Reactive-extraction of pongamia seeds for biodiesel production," *J Sci Ind Res*, **71** (2012) 822-828.
- Preto, F., Zhang, F., Wang, J. "A study on using fish oil as an alternative fuel for conventional combustors," *Fuel*, **87**(10) (2008) 2258-2268.
- Qiu, T., Guo, X., Yang, J., Zhou, L., Li, L., Wang, H., Niu, Y. "The synthesis of biodiesel from coconut oil using novel Brønsted acidic ionic liquid as green catalyst," *Chemical Engineering Journal*, **296** (2016) 71-78.
- Rahman, M., Islam, M., Rouf, M., Jalil, M., Haque, M. "Extraction of alkaloids and oil from Karanja (*Pongamia pinnata*) seed," *Journal of Scientific Research*, **3**(3) (2011) 669-675.
- Ramadhas, A.S., Jayaraj, S., Muraleedharan, C. "Biodiesel production from high FFA rubber seed oil," *Fuel*, **84**(4) (2005) 335-340.
- Raman, A.A.A. "The effects of catalysts in biodiesel production: A review," *Journal of Industrial and Engineering Chemistry*, **19**(1) (2013).
- Ramu, S., Lingaiah, N., Devi, B.P., Prasad, R., Suryanarayana, I., Prasad, P.S. "Esterification of palmitic acid with methanol over tungsten oxide supported on zirconia solid acid catalysts: effect of method of preparation of the catalyst on its structural stability and reactivity," *Applied Catalysis A: General*, **276**(1) (2004) 163-168.
- Rohman, A., Erwanto, Y., Man, Y.B.C. "Analysis of pork adulteration in beef meatball using Fourier transform infrared (FTIR) spectroscopy," *Meat Science*, **88**(1) (2011) 91-95.

- Rohman, A., Man, Y.C. "Fourier transform infrared (FTIR) spectroscopy for analysis of extra virgin olive oil adulterated with palm oil," *Food Research International*, **43**(3) (2010) 886-892.
- Román-Figueroa, C., Olivares-Carrillo, P., Paneque, M., Palacios-Nereo, F.J., Quesada-Medina, J. "High-yield production of biodiesel by non-catalytic supercritical methanol transesterification of crude castor oil (*Ricinus communis*)," *Energy*, **107** (2016) 165-171.
- Roschat, W., Siritanon, T., Kaewpuang, T., Yoosuk, B., Promarak, V. "Economical and green biodiesel production process using river snail shells-derived heterogeneous catalyst and co-solvent method," *Bioresource technology*, **209** (2016) 343-350.
- Roy, P.K., Datta, S., Nandi, S., Al Basir, F. "Effect of mass transfer kinetics for maximum production of biodiesel from *Jatropha Curcas* oil: A mathematical approach," *Fuel*, **134** (2014) 39-44.
- Rustad, T. "Physical and chemical properties of protein seafood by-products," *Maximising the value of marine by-products* (2007) 3-21.
- Rustandi, F., Wu, H. "Biodiesel production from canola in Western Australia: Energy and carbon footprints and land, water, and labour requirements," *Industrial & Engineering Chemistry Research*, **49**(22) (2010) 11785-11796.
- Sabudak, T., Yildiz, M. "Biodiesel production from waste frying oils and its quality control," *Waste management*, **30**(5) (2010) 799-803.
- Sagiroglu, A., Isbilir, S.Ş., Ozcan, M.H., Paluzar, H., Toprakkiran, N.M. "Comparison of biodiesel productivities of different vegetable oils by acidic catalysis," *Chemical Industry and Chemical Engineering Quarterly/CICEQ*, **17**(1) (2011) 53-58.
- Sahoo, P., Das, L., Babu, M., Naik, S. "Biodiesel development from high acid value polanga seed oil and performance evaluation in a CI engine," *Fuel*, **86**(3) (2007) 448-454.
- Sandesh, S., Kristachar, P.K.R., Manjunathan, P., Halgeri, A., Shanbhag, G.V. "Synthesis of biodiesel and acetins by transesterification reactions using novel CaSn (OH) 6 heterogeneous base catalyst," *Applied Catalysis A: General*, **523** (2016) 1-11.

- Sangwan, S., Rao, D., Sharma, R. "A review on Pongamia Pinnata (L.) Pierre: A great versatile leguminous plant," *Nature and Science*, **8**(11) (2010) 130-139.
- Sarantopoulos, I., Chatzisyneon, E., Foteinis, S., Tsoutsos, T. "Optimization of biodiesel production from waste lard by a two-step transesterification process under mild conditions," *Energy for Sustainable Development*, **23** (2014) 110-114.
- Saydut, A., Erdogan, S., Kafadar, A.B., Kaya, C., Aydin, F., Hamamci, C. "Process optimization for production of biodiesel from hazelnut oil, sunflower oil and their hybrid feedstock," *Fuel*, **183** (2016) 512-517.
- Schuchardt, U., Sercheli, R., Vargas, R.M. "Transesterification of vegetable oils: a review," *Journal of the Brazilian Chemical Society*, **9**(3) (1998) 199-210.
- Semwal, S., Arora, A.K., Badoni, R.P., Tuli, D.K. "Biodiesel production using heterogeneous catalysts," *Bioresource technology*, **102**(3) (2011) 2151-2161.
- Senthil, M., Visagavel, K., Saravanan, C., Rajendran, K. "Investigations of red mud as a catalyst in Mahua oil biodiesel production and its engine performance," *Fuel Processing Technology*, **149** (2016) 7-14.
- Shahir, V., Jawahar, C., Suresh, P. "Comparative study of diesel and biodiesel on CI engine with emphasis to emissions—A review," *Renewable and Sustainable Energy Reviews*, **45** (2015) 686-697.
- Shahraki, H., Entezari, M.H., Goharshadi, E. "Sono-synthesis of biodiesel from soybean oil by KF/ γ -Al₂O₃ as a nano-solid-base catalyst," *Ultrasonics sonochemistry*, **23** (2015) 266-274.
- Sharma, Y., Singh, B., Korstad, J. "Application of an efficient nonconventional heterogeneous catalyst for biodiesel synthesis from Pongamia pinnata oil," *Energy & Fuels*, **24**(5) (2010) 3223-3231.
- Sheehan, J., Camobreco, V., Duffield, J., Graboski, M., Shapouri, H. 1998. Life cycle inventory of biodiesel and petroleum diesel for use in an urban bus. Final report. National Renewable Energy Lab., Golden, CO (US).

- Silitonga, A., Ong, H.C., Mahlia, T., Masjuki, H., Chong, W. "Biodiesel conversion from high FFA crude jatropha curcas, calophyllum inophyllum and ceiba pentandra oil," *Energy Procedia*, **61** (2014) 480-483.
- Singh, V., Bux, F., Sharma, Y.C. "A low cost one pot synthesis of biodiesel from waste frying oil (WFO) using a novel material, β -potassium dizirconate (β -K₂Zr₂O₅)," *Applied Energy*, **172** (2016) 23-33.
- Soumanou, M.M., Bornscheuer, U.T. "Improvement in lipase-catalyzed synthesis of fatty acid methyl esters from sunflower oil," *Enzyme and Microbial Technology*, **33**(1) (2003) 97-103.
- Stamenković, O.S., Todorović, Z.B., Lazić, M.L., Veljković, V.B., Skala, D.U. "Kinetics of sunflower oil methanolysis at low temperatures," *Bioresource Technology*, **99**(5) (2008) 1131-1140.
- Steigers, J.A. 2002. Demonstrating the use of fish oil as fuel in a large stationary diesel engine. *Advances in seafood byproducts conference proceedings, Alaska Sea Grant, Fairbanks, AK*. pp. 187-200.
- Stojković, I.J., Miladinović, M.R., Stamenković, O.S., Banković-Ilić, I.B., Povrenović, D.S., Veljković, V.B. "Biodiesel production by methanolysis of waste lard from piglet roasting over quicklime," *Fuel*, **182** (2016) 454-466.
- Syamsuddin, Y., Murat, M., Hameed, B. "Synthesis of fatty acid methyl ester from the transesterification of high-and low-acid-content crude palm oil (*Elaeis guineensis*) and karanj oil (*Pongamia pinnata*) over a calcium–lanthanum–aluminum mixed-oxides catalyst," *Bioresource technology*, **214** (2016) 248-252.
- Tada, A. "Basic properties of metal phosphates and their catalytic activity in the decomposition of diacetone alcohol," *Bulletin of the Chemical Society of Japan*, **48**(5) (1975) 1391-1393.
- Tanaka, H., Tsuda, E., Nishikawa, H., Fuji, M. "FTIR studies of adsorption and photocatalytic decomposition under UV irradiation of dimethyl sulfide on calcium hydroxyapatite," *Advanced Powder Technology*, **23**(1) (2012) 115-119.

- Tang, Y., Meng, M., Zhang, J., Lu, Y. "Efficient preparation of biodiesel from rapeseed oil over modified CaO," *Applied Energy*, **88**(8) (2011) 2735-2739.
- Tang, Y., Xu, J., Zhang, J., Lu, Y. "Biodiesel production from vegetable oil by using modified CaO as solid basic catalysts," *Journal of Cleaner Production*, **42** (2013) 198-203.
- Thompson, J.G., Bertman, S., Hill, S., Kushner, L., Miller, J.B. "Using headspace solid phase microextraction to evaluate the odor compounds in trap grease feedstock for biodiesel," *Biomass and Bioenergy*, **43** (2012) 36-41.
- Upreti, B.K., Chaiwong, W., Ewelike, C., Rakshit, S.K. "Biodiesel production using heterogeneous catalysts including wood ash and the importance of enhancing byproduct glycerol purity," *Energy Conversion and Management*, **115** (2016) 191-199.
- Usta, N., Aydoğan, B., Çon, A., Uğuzdoğan, E., Özkal, S. "Properties and quality verification of biodiesel produced from tobacco seed oil," *Energy Conversion and Management*, **52**(5) (2011) 2031-2039.
- Vahid, B.R., Haghighi, M. "Urea-nitrate combustion synthesis of MgO/MgAl₂O₄ nanocatalyst used in biodiesel production from sunflower oil: Influence of fuel ratio on catalytic properties and performance," *Energy Conversion and Management*, **126** (2016) 362-372.
- Veljković, V., Lakićević, S., Stamenković, O., Todorović, Z., Lazić, M. "Biodiesel production from tobacco (*Nicotiana tabacum* L.) seed oil with a high content of free fatty acids," *Fuel*, **85**(17) (2006) 2671-2675.
- Venkatesan, J., Kim, S.K. "Effect of temperature on isolation and characterization of hydroxyapatite from tuna (*Thunnus obesus*) bone," *Materials*, **3**(10) (2010) 4761-4772.
- Verma, P., Sharma, M. "Comparative analysis of effect of methanol and ethanol on Karanja biodiesel production and its optimisation," *Fuel*, **180** (2016) 164-174.
- Verma, P., Sharma, M., Dwivedi, G. "Evaluation and enhancement of cold flow properties of palm oil and its biodiesel," *Energy Reports*, **2** (2016a) 8-13.

- Verma, P., Sharma, M., Dwivedi, G. "Prospects of bio-based alcohols for Karanja biodiesel production: An optimisation study by Response Surface Methodology," *Fuel*, **183** (2016b) 185-194.
- Wang, L., Yang, J. "Transesterification of soybean oil with nano-MgO or not in supercritical and subcritical methanol," *Fuel*, **86**(3) (2007) 328-333.
- Wei, Z., Xu, C., Li, B. "Application of waste eggshell as low-cost solid catalyst for biodiesel production," *Bioresource technology*, **100**(11) (2009) 2883-2885.
- Witoon, T. "Characterization of calcium oxide derived from waste eggshell and its application as CO₂ sorbent," *Ceramics International*, **37**(8) (2011) 3291-3298.
- Witoon, T., Bumrungsalee, S., Vathavanichkul, P., Palitsakun, S., Saisriyoot, M., Faungnawakij, K. "Biodiesel production from transesterification of palm oil with methanol over CaO supported on bimodal meso-macroporous silica catalyst," *Bioresource technology*, **156** (2014) 329-334.
- Woo, C., Kook, S., Hawkes, E.R., Rogers, P.L., Marquis, C. "Dependency of engine combustion on blending ratio variations of lipase-catalysed coconut oil biodiesel and petroleum diesel," *Fuel*, **169** (2016) 146-157.
- Wu, H., Colson, G., Escalante, C., Wetzstein, M. "An optimal US biodiesel fuel subsidy," *Energy policy*, **48** (2012) 601-610.
- Wu, H., Liu, Y., Zhang, J., Li, G. "In situ reactive extraction of cottonseeds with methyl acetate for biodiesel production using magnetic solid acid catalysts," *Bioresource technology*, **174** (2014) 182-189.
- Yahyaee, R., Ghobadian, B., Najafi, G. "Waste fish oil biodiesel as a source of renewable fuel in Iran," *Renewable and Sustainable Energy Reviews*, **17** (2013) 312-319.
- Yang, F.-X., Su, Y.-Q., Li, X.-H., Zhang, Q., Sun, R.-C. "Preparation of biodiesel from *Idesia polycarpa* var. *vestita* fruit oil," *Industrial Crops and Products*, **29**(2) (2009) 622-628.
- Yang, J., Astatkie, T., He, Q.S. "A comparative study on the effect of unsaturation degree of camelina and canola oils on the optimization of bio-diesel production," *Energy Reports*, **2** (2016) 211-217.

References

- Yee, K.F., Tan, K.T., Abdullah, A.Z., Lee, K.T. "Life cycle assessment of palm biodiesel: revealing facts and benefits for sustainability," *Applied Energy*, **86** (2009) S189-S196.
- Zexue, D., Zhong, T., Haijing, W., Jianli, Z., Yanfeng, C., Enze, M. "Research and development of a sub-critical methanol alcoholysis process for producing biodiesel using waste oils and fats," *Chinese Journal of Catalysis*, **34**(1) (2013) 101-115.