

REFERENCES

- Adiati, U., Puastuti, W., Mathius, I., 2004, Peluang Pemanfaatan Tepung Bulu Ayam sebagai Bahan Pakan Ternak Ruminansia, *Wartazoa*, 14 (1), 39-44.
- Anonim, 2004, Spesifikasi Kompos dari Sampah Organik Domestik, *Badan Standardisasi Nasional*.
- Arifin, T., 2008, Pemanfaatan Limbah Bulu Ayam Potong Metode Pengukusan Untuk Bahan Ransum Ayam Potong, *Master Tesis - Pengelolaan Sumber Daya Alam & Lingkungan*, USU Institutional Repository.
- Arvianto, R.I., 2019, Preparasi Humus Sintetik Kaya Nitrogen dan Sulfur dari Limbah Rumah Pemotongan Ayam, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Bozorgi, H.R., 2012, Effects of Foliar Spraying with Marine Plant *Ascophyllum nodosum* Extract and Nano Iron Chelate Fertilizer on Fruit Yield and Several Attributes of Eggplant (*Solanum melongena* L.), *Journal of Agricultural and Biological Science*, 7 (5).
- Bragg, W.H., 1913, The Reflection of X-rays by Crystals, (II.). *Proc R Soc A: Math Phys EngSci*, 89, 246–248.
- Camp, W., 2017, Strategies for Identifying Organic Matter Types in SEM, Santa Fe, New Mexico, Anadarko Petroleum Corporation.
- Chang, R., Mylotte, R., Hayes, M., McInerney, R., Tzou, Y., 2014, A comparison of the compositional differences between humic fractions isolated by the IHSS and exhaustive extraction procedures. *Naturwissenschaften*, 101(3), 197-209, doi: 10.1007/s00114-013-1140-4
- Clare, D.A., and Swaisgood, H.E., 2000, Bioactive milk peptides: A prospectus, *Journal of Dairy Science*, 83, 1187–1195.
- Colla, G., Hoagland, L., Ruzzi, M., Cardarelli, M., Bonini, P., Canaguier, R., Rouphael, Y., 2017, Biostimulant Action of Protein Hydrolysates: Unraveling Their Effects on Plant Physiology and Microbiome, *Frontiers In Plant Science*, 8. doi: 10.3389/fpls.2017.02202
- Du, M., Xu, M., Sun, J., and Gao, L., 2013, Synthesis of α -Fe₂O₃ Nanoparticles from Fe(OH)₃ Sol and Their Composite with Reduced Graphene Oxide for Lithium Ion Batteries, *J. Mater. Chem. A*, 1, 7154-7158.
- Eriska, H., Dewi, K., Darmawan Pasek, A., Damanhuri, E., 2017, Hydrothermal Carbonization of Biomass Waste by Using A Stirred Reactor: An Initial Experimental Results, *REAKTOR*, 16(4), 212. doi: 10.14710/reaktor.16.4.212-217
- Stevenson, F.J., 1994, Humus Chemistry: Genesis, Composition, Reactions, Wiley & Sons, New York.
- Funke, A., Ziegler, F., 2010, Hydrothermal carbonization of biomass: a summary and discussion of chemical mechanisms for process engineering, *Biofuels Bioprod, Biorefin.* 4, 160–177.
- Gaffney, J.S., Marley, N.A., Clark, S.B., 1996, Humic and Fulvic Acids : Isolation, Structure and Environmental Role, *American Chemical Society*, Washington, DC.

- Giovanela, M., Crespo, J., Antunes, M., Adamatti, D., Fernandes, A., & Barison, A., 2010, Chemical and spectroscopic characterization of humic acids extracted from the bottom sediments of a Brazilian subtropical microbasin. *Journal Of Molecular Structure*, 981(1-3), 111-119. doi: 10.1016/j.molstruc.2010.07.038
- Goldstein, J., Newbury, D., Joy, D., Lyman, C., Echlin, P., Lifshin, E., 2003, Scanning electron microscopy and x-ray microanalysis. 3rd ed, *Springer*, New York.
- Hayes, M.H.B., Swift, R.S., Byrne, C.,M., Song, G., dan Simpson, A.J., 2010, Humin: The Simplest of The Humic Fractions, *International Humic Substances Society (IHSS)*.
- He, C., Giannis, A., Wanga, J.Y., 2013, Conversion of sewage sludge to clean solid fuel using hydrothermal carbonization: hydrochar fuel characteristics and combustion behavior, *Appl. Energy* 111, 257–266.
- IBI, 2012, Standardized product definition and product testing guidelines for biochar that is used in soil, International Biochar Initiative (IBI) biochar standards.
- Kabata-Pendias A., 2011, Trace elements in soils and plants.,4th ed, Boca Raton: *Chemical Rubber Company Press*.
- Khanolkar, G.R., Rauls, M.B., Kelly, J.P., Graeve, O.A., Hodge, A.M., Eliasson, V., 2016, Shock wave response of ironbased in situ metallic glass matrix composites, *Sci.Rep*, 6:1–9
- Khosa, M., and Ullah, A., 2013, A sustainable role of keratin biopolymer in green chemistry: a Review *J. Food Process, Bev*, 1 1-8.
- Kuncaka, A., Arvianto, R., Latifa, A., Rambe, M., Suratman, A., & Triono, S. ,2021, Analysis and Characterization of Solid and Liquid Organic Fertilizer from Hydrothermal Carbonization (HTC) of Chicken Feather and Blood Waste, *Indonesian Journal Of Chemistry*, 21(3), 651.
- Larcher, W.,2004, *Ecofisiologia vegetal*, 2th ed, São Carlos, Rima.
- Las, I., and Setyorini, D., 2010, Kondisi lahan, teknologi, arah, dan pengembangan pupuk majemuk NPK dan pupuk organik, *Prosiding Semnas Peranan Pupuk NPK dan Organik dalam Meningkatkan Produksi dan Swasembada Beras Berkelanjutan*, Balai Besar Litbang Sumberdaya Lahan Pertanian, Bogor, Indonesia.
- Libra, J.A., Ro, K.S., Kammann, C., Funked, A., Berge, N.D., Neubauer, Y., Titirici, M.M., Fühner, C., Bens, O., Kern, J., and Emmerich, K.H., 2011, Hydrothermal Carbonization of Biomass Residuals: A Comparative Review of the Chemistry, Processes and Applications of Wet and Dry Pyrolysis, *Biofuels*, 2(1), pp. 71–106.
- Manya[^], J.J., 2012, Pyrolysis for biochar purposes: a review to establish current knowledge gaps and research needs, *Environ. Sci. Technol.* 46, 79397954.
- Maylani, 2016, Sebagai Adsorben Ion Logam Kadmium *Info Artikel*, 5(2), 1–6.
- Mazotto, A., de-Melo, A., Macrae, A., Rosado, A., Peixoto, R., Cedrola, S., 2011 Biodegradation of feather waste by extracellular keratinases and gelatinases from *Bacillus* spp, *World J. Microb, Biotech*, 27 1355-65.

- Muslem, 2017, Karbonisasi Polivinil Klorida dan Preparasi Komposit arang-Fe₃O₄ sebagai adsorben Co(II) dengan metode hidrotermal dan hidrotermal-pirolisis, *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Onifade, A.A., Al-Sane, Na., Al-Musallam, A.A., Al-Zarban, S., 1998, A review: Potentials for biotechnological applications of keratin degrading microorganisms and their enzymes for nutritional improvement of feathers and other keratins as livestock feed resources, *Bioresour Technol*, 66: 1–11.
- Pettett, A.M., Kurtboke, D.I., 2004, development of an environmentally friendly biofertilizer with keratin degrading and antibiotic producing actinomycetes. *Actinomycetologica*, 18:34–42.
- Piccolo, A., 2002, The Supramolecular Structure of Humic Substances : A Novel Understanding of Humus Chemistry and Implications in Soil Science, *Academic Press*, Vol 75, 57-58.
- Puastuti, W., 2007, TEKNOLOGI PEMROSESAN BULU AYAM DAN PEMANFAATANNYA SEBAGAI SUMBER PROTEIN PAKAN RUMINANSIA. *WARTAZOA*, 17(2), 54. Retrieved 16 July 2021,
- Ayilara, M., Olanrewaju, O., Babalola, O., & Odeyemi, O. ,2020, Waste Management through Composting: Challenges and Potentials. *Sustainability*, 12(11), 4456. doi: 10.3390/su12114456
- Sutton, R., Sposito, G., 2005, Molecular structure in soil humic substances: the new view, *Environ. Sci. Technol.*, 39(23):9009-15.
- Rachman, A., Dariah, A. and S., S., 2018, PENGELOLAAN SAWAH SALIN BERKADAR GARAM TINGGI, *IAARD PRESS*, XI, 12.
- Rades, S., Hodoroaba, V.-D., Salge, T., Wirth, T., Lobera, M.P., Labrador, R.H., Natte, K., Behnke, T., Gross, T. and Unger, W.E.S., 2014, High-Resolution Imaging with SEM/T-SEM, EDX and SAM as a Combined Methodical Approach for Morphological and Elemental Analyses of Single Engineered Nanoparticles, *RSC Advances*, 4, 49577.
- Rahayu, S., and Bata, M., 2014, Quality of Chicken Feather Processed in Different Conditions, 16(3), 170-175.
- Rampengan, A.M., 2017, Analisis Gugus Fungsi Pada Polimer Polyethylene Glycol (PEG) Coated-Nanopartikel Oksida Besi Hitam (Fe₃O₄) Dan Biomolekul, *Fullerene Journal of Chemistry*, 2(2), 96 <https://doi.org/10.37033/fjc.v2i2.18>
- Rasyaf, M., 1993, Bahan Makanan Unggas di Indonesia. Penerbit Kanisius. Yogyakarta.
- Saha, S., Arshad, M., Zubair, M., & Ullah, A., 2018, Keratin as a Biopolymer. *Keratin As A Protein Biopolymer*, 163-185. https://doi.org/10.1007/978-3-030-02901-2_6
- Sanmanee, N., Areekijseeree, M., 2010, The effects of fulvic acid on copper bioavailability to porcine oviductal epithelial cells. *Biol. Trace Elem. Res.* 135, 162–173.
- Someus, E., 2009, Recycling and upgrading of bone meal for environmentally friendly crop protection and nutrition: the PROTECTOR project, *Handbook*

- Of Waste Management And Co-Product Recovery In Food Processing*, 553-582. <https://doi.org/10.1533/9781845697051.4.553>.
- Sudarmi., 2013., Pentingnya Unsur Hara Mikro Bagi Pertumbuhan Tanaman, *Widyatama*. 22(2), 178.
- Teja, A.S., and Koh, P.Y., 2009, Synthesis, properties, and applications of magnetic iron oxide nanoparticles, *Prog. Cryst. Growth Charact. Mater.*, 55, 22–45.
- Tumimbang, M., Tamod, Z., Kumolontang, W., 2019, UJI KUALITATIF KANDUNGAN HARA KOMPOS CAMPURAN BEBERAPA KOTORAN TERNAK PELIHARAAN. *EUGENIA*, 22(3). doi: 10.35791/eug.22.3.2016.23256
- Wang, B., Yang, W., McKittrick, J., Meyers, M.A., 2016, Keratin: Structure, mechanical properties, occurrence in biological organisms, and efforts at bioinspiration *Prog. Mater. Sci.* 76 229-18.