

DAFTAR PUSTAKA

- Abu Bakar, R., Yahya, R., Gan, S.N., 2016, Production of High Purity Amorphous Silica from Rice Husk, *Procedia. Chem.* 19, 189-195
- Alemi, A., Khademinia, S., Sertkol, M., 2014, Lithium disilicate ($\text{Li}_2\text{Si}_2\text{O}_5$): Mild Condition Hydrothermal Synthesis, Characterization, and Optical Properties, *Journal of Nanostructure*, 4, 407-412
- Athinarayanan, J., Periasamy, V.S., Alhazmi, M., Alatiah, A.K., Alshatwi, A.A., 2015, Synthesis of Biogenic Silica Nanoparticles from Rice Husks for Biomedical Applications, *Ceram. Int.* 41, 275-281
- Belton, D.J., Deschaume, O., Perry, C.C., 2012, An Overview of the Fundamentals of the Chemistry of Silica with Relevance to Biosilicification and Technological Advances, *FEBS J.* 279, 1710-1720
- Briffa, S.M., Sinagra, E., Vella, D., 2012, TEOS based consolidant for maltese globigerina limestone : Effect of hydroxyl conversion treatment, 12th International Congress on the Deterioration and Conservation of Stone, Columbia University, New York.
- Carmona, V.B., Oliveira, R.M., Silva, W.T.L., Mattoso, L.H.C., Marconcini, J.M., 2013, Nanosilica from Rice Husk: Extraction and Characterization, *Ind. Crops. Prod.* 43, 291-296
- Chang, C.C., Wang, C.C., Kumta, P.N., 2001, Chemical Synthesis and Characterization of Lithium Orthosilicate (Li_4SiO_4), *Mater. Design.* 22, 617-623
- Chrusciel, J., Slusarski, L., 2003, Synthesis of Nano-Silica by the Sol-gel Method and Its Activity Toward Polymers, *Mater. Sci.* 21, 4
- Clifton, J.R., 1980, Stone consolidating materials – A status report, Volume 1118 of NBS Technical Note, National Bureau of Standards, United States.
- De Guzman, R.C., De Leon, A.C.C., Tiu, B.DB., Baltazar, D., Advincula, R.C., 2015, Characterization of Nanocolloidal Silica Formation of Untreated and Treated Simulated Geothermal Brine through Various Particle Size, and Zeta Potential Measurement Techniques, *Proceedings World Geothermal Congress 2015, Melbourne*
- Doehne, E., Price, C.A., 2010, *Stone Conservation: An Overview of Current Research*, The Getty Conservation Institute, Los Angeles
- Domenico, M.D., Amorim, S.M., Moura-Nickel, C.D., Jose, H.J., Moreira, R.F.P.M., (2019), Kinetics of the Carbonation Reaction of Lithium Orthosilicate Using a Typical CO_2 Concentration of Combustion Gases, *Mat. Res.* 22 (suppl. 1)
- Fardad, M.A., 2000, Catalysts and the Structure of SiO_2 Sol-Gel Films, *J. Mater. Sci.* 35, 1835-1841
- Fatimah, I., Said, A., and Hasanah, U.A., 2015, Preparation of TiO_2 - SiO_2 using rice husk ash as silica source and the kinetics study as photocatalyst in methyl violet decolorization, *Bull. Chem. React. Eng. Catal.*, 10 (1), 43-49.
- Franzoni, E., Pigino, B., Leemann, A., Lura, P., 2014(A), Use of TEOS for Fired-Clay Bricks Consolidation, *Mater. Struct.* 47, 7

- Franzoni, E., Sassoni, E., Graziani, G., 2014(B), Comparison of porous sedimentary stone consolidation by a new hydroxyapatite-based treatment and by TEOS, VIII Congresso Nazionale di Archeometria Scienze e Beni Culturali, Bologna.
- Franzoni, E., Graziani, G., Sassoni, E., Bacilieri, G., 2015, Solvent-based ethyl silicate for stone consolidation: Influence of the application technique on penetration depth, efficacy, and pore occlusion, *Materials and Structures*, 11
- Goffer, Z., 2007, *Archaeological Chemistry*, Wiley-Interscience; A John Wiley and Sons Publication, New Jersey
- Graceli, J.B., Sena, G.C., Lopes, P.F.I., Zamprogno, G.C., da Costa, M.B., Godoi, A.F.L., dos Santos, D.M., de Marchi, M.R.R., and dos Santos Fernandez, M.A., 2013, Organotins: A review of their reproductive toxicity, biochemistry, and environmental fate, *Reprod. Toxicol.*, 36, 40–52.
- Grzeskowiak, M., Wrobel, R J., Grzechulska, J., Przepiorski, J., 2014, Preparation and characterization of titania powders obtained via hydrolysis of titanium tetraisopropoxide, *Materials Science-Poland*, 32(1), 71-79
- Gupta, S P, 2011(A), Modification of the Physical Properties of Deteriorated Stone by Chemical Consolidation Treatment, *Int. J. Conserv. Sci.* 2, 4, 229-234
- Gupta, S P, 2011(B), Chemical Conservation of Chamunda Devi with Ethyl Silicates Stone Consolidant, *Int. J. Chem. Sci.* 9, 4, 1987-1992
- Gu, S., Zhou, J., Luo, Z., Wang, Q., Ni, M., 2013, A Detailed Study of the Effect of Pyrolysis Temperature and Feedstock Particle Size on the Preparation of Nanosilica from Rice Husk, *Ind. Crops. Prod.* 50, 540-549
- Gu, S., Zhou, J., Yu, C., Luo, Z., Wang, Q., Shi, Z., 2015, A Novel Two-stages Thermal Synthesis Method of Generating Nanosilica from Rice Husk via Pre-pyrolysis Combined with Calcination, *Ind. Crops. Prod.* 65, 1-6
- Hanaor, D.A.H., Kolb, M.H.H., Gan, Y., Kamlah, M., Knitter, R., 2014, Solution Based Synthesis of Mixed-phase Materials in the $\text{Li}_2\text{TiO}_3\text{-Li}_4\text{SiO}_4$ System, *Journal of Nuclear Materials*, 456, 151-161
- Hendrix, Y., Yu, Q, Lazaro, A., Brouwer, H.J.H., 2015, Titania-Silica Composite: A Review on the Photocatalytic Activity and Synthesis Methods, *World j. nano. sci. eng.* 5, 161-177
- Hernandez, C.S., Zarraga, R., Alonso, S., Sugita, S., Calixto, S., Cervantes, J., 2009, Effect of Solvent Type on Polycondensation of TEOS Catalyzed by DBTL as Used for Stone Consolidation, *J Sol-Gel Sci Technol*, 49, 301-310
- Indart, A.Z., Arce, P.L., Leal, N., Simao, J., Zoghlami, K., 2016, Consolidation of a Tunisian Bioclastic Calcarenite: From Conventional Ethyl Silicate Products to Nanostructured and Nanoparticle Based Consolidants, *Constr. Build. Mater.* 116, 188-202
- Issa, A.A., Luyt, A., 2019, Kinetics of Alkoxysilanes and Organo Alkoxysilane Polymerization: A Review, *Polymers*, 11, 537
- Juhasova, E., Safronie, R., Bairrao, R., 2008, Stone Masonry in Historical Buildings – Ways to Increase Their Resistance and Durability, *Eng. Struct.* 30, 2194-2205
- Kim, E.K., Won, J., Do, J., Kim, S.D., Kang, Y.S., 2009, Effect of Nanoparticle and GPTMS Addition on TEOS-based Stone Consolidants, *J. Cult. Heritage.* 10, 214-221

- Ksinopoulou, E., Bakolas, A., Moropoulou, A., 2012, Particle Modified Consolidants in the Consolidation of Porous Stones, *12th International Congress on the Deterioration and Conservation of Stone*, Columbia University, New York
- Ksinopoulou, E., Bakolas, A., Moropoulou, A., 2016, Modifying Si-based Consolidants Through the Addition of Colloidal Nano-Particles, *Appl Phys A*, 122, 267
- Kumar, R., Kumar, A. V., 1999, *Biodeterioration of Stone in Tropical Environment*, The Getty Conservation Institute, Los Angeles
- Le Bas, M.J., Streckeisen, A.L., 1991, The IUGS Systematics of Igneous Rocks, *J. Geol. Soc.* 148, 825-833
- Li, D., Xu, F., Liu, Z., Zhu, J., Zhang, Q., Shao, L., 2013, The Effect of Adding PDMS-OH and Silica Nanoparticles on Sol-Gel Properties and Effectiveness in Stone Protection, *Appl. Surf. Sci.* 266, 368-374
- Liou, T.H., Yang, C.C., 2011, Synthesis and Surface Characteristics of Nanosilica Produced from Alkali-Extracted Rice Husk Ash, *Mater. Sci. Eng. B.* 176, 521-529
- Liu, R., Han, X., Huang, X., Li, W., Luo, H., 2013, Preparation of Three-component TEOS-based Composite for Stone Conservation by Sol-Gel Process, *J. Sol-Gel. Sci. Technol.* 68, 19-30
- Lubelli, B., van Hees, R.P.J., Nijland, T.G., Bolhuis, J., 2015, A New Method for Making Artificially Weathered Stone Specimens for Testing of Conservation Treatments, *J Cult. Heritage.* 16, 688-704
- Lucas, S., Tognonvi, M.T., Gelet, J.L., Soro, J., Rossignol, S., 2011, Interaction Between Silica Sand and Sodium Silicate Solution During Consolidation Process, *J. Non-Cryst. Solids.* 357, 1310-1318
- Manurung, P., Situmeang, R., Ginting, E., and Pardede, I, 2015, Synthesis and characterization of titania-rice husk silica composite as photocatalyst, *Indones. J. Chem.*, 15 (1), 36–42.
- Marimuthu, T., Mohammad, S., and Alias, Y., 2014, Synthesis and characterization of new silica-titania mixed oxide in the presence of 1-butyl-3-methylimidazolium bis(trifluoromethylsulfonyl) imide by sol-gel technique, *J. Sol-Gel Sci. Technol.*, 70, 104–110.
- Meucci, C., 2007, *Report on Borobudur Research Program: Degradation and Conservation of the Stone*, Studio Meucci, Rome
- Milani, C., Velo-Simpson, M.L., Scherer, G.W., 2007, Particle-Modified Consolidants: A Study on the Effect of Particles and Consolidation Effectiveness, *J. Cult. Heritage.* 20, 1-6
- Milea, C.A., Bogatu, C., Duta, A., 2011, The Influence of Parameters in Silica Sol-Gel Process, *Bulletin of the Transilvania University of Brasov: Series I*, 4, 53, 1
- Milton, F.A., Lacerda, M.G., Sinoti, S.B.P., Masquita, P.G., Prakasan, D., Coelho, M.S., de Lima, C.L., Martini, A.G., Pazzine, G.T.P., Borin, M.F., Amato, A.A., and Neves, F.A.R., 2017, Dibutyltin compounds effects on PPAR/RXR activity, adipogenesis, and inflammation in mammalians cells, *Front. Pharmacol.*, 8, 507.
- Mutlu, B.R., Yeom, S., Tong, H.W., Wackett, L.P., Aksan, A., 2013, Silicon Alkoxide Cross-linked Silica Nanoparticle Gels for Encapsulation of Bacterial Biocatalysts, *J. Mater. Chem. A*, 1, 11051-11060
- Nayak, J.P., Bera, J., 2012, Bioactivity Characterization of Amorphous Silica Ceramics Derived from Rice Husk Ash, *Silicon*, 4, 57-60

- Noor, D., 2009, Pengantar Geologi, Penerbit Universitas Pakuan
- Ondrasik, M., Kopecky, M., 2014, Rock Pore Structure and Main Reason of Rock Deterioration, *Stud. Geotech. Mech.* 36, 1, 79-88
- Parashar, G., Srivastava, D., Kumar, P., 2001, Review: Ethyl Silicate Binders for High Performance Coating, *Prog. Org. Coat.* 42, 1-14
- Pereyra, A.M., Giudice, C.A., 2008, Ethyl Silicates with Different Hydrolysis Degree Like Non-Flammable Impregnating Material for Wood, *Ciencia y Tecnologia.* 10, 2, 113-127
- Pietras, P., Przekop, R., Maciejewski, H., 2013, New Approach to Preparation of Gelatine/SiO₂ Hybrid Systems by the Sol-Gel Process, *Ceramics-Silikaty*, 57, 1, 58-65
- Pinkas, J., 2005, Chemistry of Silicates and Aluminosilicates; Review papers, *Ceramics-Silikaty*, 49, 4, 287-298
- Pinto, A.P.F., Rodrigues, J.D., 2008, Stone Consolidation: The Role of Treatment Procedures, *J. Cult. Heritage.* 9, 38-53
- Pollard, A.M., Batt, C.M., Stern, B., Young, S.M.M., 2007, *Analytical Chemistry in Archaeology*, Cambridge University Press, Cambridge – New York
- Puccini, M., Harada, T., Stefanelli E, Vitolo, S., Hatton, T.A., (2017), Sol-gel Synthesis of Li₄SiO₄ Nanoparticles for CO₂ Capture at High Temperature, *Chem. Eng. Trans.* Vol 57, 1147-1152
- Remzova, M., Sasek, P., Frankeova, D., Slizkova, Z., Rathousky, J., 2016, Effect of Modified Ethylsilicate Consolidants on the Mechanical Properties of Sandstone, *Constr. Build. Mater.* 112, 674-681
- Rodrigues, J.D., 2001, Consolidation of Decayed Stone. A Delicate problem with few Practical Solution, *Hist. Const. B.* 1-12
- Rodrigues, J.D., 2015, Defining, Mapping and Assessing Deterioration Pattern in Stone Conservation Projects, *J. Cult. Heritage.* 16, 267-275
- Ruzimuradov, O. N., 2011, Formation of bimodal porous silica-titania monoliths by solgel route, *IOP Conf. Series: Materials Science and Engineering* 18, 032004
- Salvo, S.D., 2014, Nanotechnology for Cultural Heritage, *Int. J. Sci. Technol. Soc.* 2, 28-32
- Sankar, S., Sharma, S.K., Kaur, N., Lee, B., Kim, D.K., Lee, S., Jung, H., 2016, Biogenerated Silica Nanoparticles Synthesis from Sticky, Red, and Brown Rice Husk Ashes by a Chemical Method, *Ceram. Int.*, 42, 4875-4885
- Sinko, K., 2010, Influence of Chemical Conditions on the Nanoporous Structure of Silicate Aerogels, *Materials*, 3, 704-740
- Sunday, A.O., Alarafa, B.A., and Oladele, O.G., 2012, Toxicity and speciation analysis of organotin compounds, *Chem. Speciation Bioavailability*, 24 (4), 216–226.
- Tang, T., Zhang, Z., Meng, J.B., Luo, D.L., 2009, Synthesis and Characterization of Lithium Silicate Powders, *Fusion. Eng. Des.* 84, 2124-2130
- Thorn, A., 2012, Lithium Silicate Consolidation of Wet Stone and Plaster, *12th International Congress on the Deterioration and Conservation of Stone*, Columbia University New York
- Tipsothaiyana, N., Jarupan, L., Noppakundilokrat., 2015, Enhancement of Flexographic Print Quality on Bleached Kraft Liner Using Nano-silica from Rice Husk, *Prog. Org. Coat.* 87, 232-241

- Tognonvi, M.T., Soro, J., Rossignol, S., 2012 (A), Physical – Chemistry of Silica/Alkaline Silicate Interaction During Consolidation. Part 1: Effect of Cation Size, *J. Non-Cryst. Solids*. 358, 81-87
- Tognonvi, M.T., Soro, J., Gelet, J.L., Rossignol, S., 2012 (B), Physico – Chemistry of Silica/Na Silicate Interaction During Consolidation. Part 2: Effect of pH, *J. Non-Cryst. Solids*. 358, 492-501
- Torraca, G., 2009, *Lectures on Material Science for Architectural Conservation*, The Getty Conservation Institute, Los Angeles
- Trompette, J.L., and Meireles, M., 2003, Ion-specific effect on the gelation kinetics of concentrated colloidal silica suspensions, *J. Colloid Interface Sci.*, 263 (2), 522–527.
- Ulatovska-Jarza, A., Holowacs, I., Wysocka, K., and Podbielska, H., 2009, Silica-bases versus silica-titania sol-gel materials comparison of the physical properties: Surface tension, gelation time, refractive index and optical transmittance, *Opt. Appl.*, 39 (1), 211–220.
- Vasconcelos, D.C.L., Costa, V.C., Nunes, E.H.M., Sabioni, A.C.S., Gasparon, M., and Vasconcelos, W.L., 2011, Infrared spectroscopy of titania sol-gel coatings on 361L stainless steel, *Mater. Sci. Appl.*, 2 (10), 1375–1382.
- Verma, J., Bhattacharya, A., 2018, Development of coating formulation with silica-titania core-shell nanoparticles against pathogenic fungus, *R. Soc. Open. Sci.*, 5 : 180633.
- Vivar, J.M., 2006, The Interaction of Dibutyltin Dilaurate with Tetraethyl Orthosilicate in Sol-Gel Systems, *J. Sol-Gel. Sci. Techn.* 38, 159-166
- Wheeler, G., 2005, *Alkoxysilanes and the Consolidation of Stone*, Getty Publication, Los Angeles
- Xiangwei, W., Zhaoyin, W., Xiaogang, X., Xiuyan, W., Jiu, L., 2009, Synthesis and Characterization of Li₄SiO₄ nano-powders by a Water-based Sol-Gel Process, *J. Nucl. Mater.* 392, 471-475
- Xu, F., Li, D., Zhang, W., Zhang, H., Xu, J., 2012, Effect of Addition of Colloidal Silica Particles on TEOS-based Stone Protection Using n-Octylamine as a Catalyst, *Prog. Org. Coat.* 75, 429-434
- Yuanting, W., Menglong, L., Xiufeng, W., Lili, W., 2016, Preparation and characterization of titania-silica composite particles by Pechini sol-gel method, *MATEC Web of conference*, 67, 03049.
- Yu, Y., Zhu, M., Liang, W., Rhodes, S., and Fang, J., 2015, Synthesis of silica-titania composite aerogel beads for the removal of Rhodamine B in water, *RSC Adv.*, 5 (89), 72437–72443.
- Yuvakkumar, R., Nathanael, A.J., Rajendran, V., Hong, S. I., 2014(A), Rice Husk Ash Nanosilica to Inhibit Human Breast Cancer Cell Line (3T3), *J. Sol-Gel. Technol.* 71, 198-205
- Yuvakkumar, R., Elango, V., Rajendran, V., Kannan, N., 2014 (A), High Purity Nano Silica Powder from Rice Husk Using a Simple Chemical Method, *J. Exp. Nanosci.* 9, 3, 272-281
- Yuvakkumar, R., Nathanael, A.J., Rajendran, V., and Hong, S.I., 2014 (B), Rice husk ash nanosilica to inhibit breast cancer cell line (3T3), *J Sol-Gel Sci Technol*, 72: 198-205
- Zarraga, R., Cervantes, J., Hernandez, C.S., Wheeler, G., 2010, Effect of the Addition of Hydroxyl-Terminated Polydimethylsiloxane to TEOS-based Stone Consolidants, *J. Cult. Heritage*. 11, 138-144

- Zendri, E., Biscontin, G., Nardini, I., Riato, S., 2006, Characterization and Reactivity of Silicatic Consolidants, *Constr. Build. Mater.* 21, 1098-1106
- Zhang, H., Quan, X., Chen, S., Zhao, H., 2006., Fabrication and Characterization of Silica/Titania Nanotubes Composite Membrane with Photocatalytic Capability, *Environ. Sci. Technol.* 40, 6104-6109
- Zhang, X., Wen, W., Yu, W., Qiu, F., Chen, Q., Yang, D., 2016, Preparation, Characterization of Nano-silica/Fluoroacrylate Material and the Application in Stone Surface Conservation, *J. Polym. Res.* 23, 75
- Zornoza-Indart, A., Lopez-Arce, P., Leal, N., Simão, J., and Zoghلامي, K., 2016, Consolidation of a Tunisian bioclastic calcarenite: From conventional ethyl silicate products to nanostructured and nanoparticle-based consolidants, *Constr. Build. Mater.* 116, 188–202.
- Zulfiqar, U., Subhani, T., Husain, S.W., 2015, Toward Tunable Size of Silica Particles from Rice Husk, *J. Non-Cryst. Solids.* 429, 61-69
- Zulkifli, N.S.C., Ab Rahman, I., Mohamad, D., Husein, A., 2013, A Green Sol-Gel Route for the Synthesis of Structurally Controlled Silica Particles from Rice Husk for Dental Composite Filler, *Ceram. Int.* 39, 4559-4567