

## DAFTAR PUSTAKA

- Agung, S. T., 2011, *Pemanfaatan Abu Vulkanik Gunung Merapi Sebagai Bahan Tambahan dalam Pembuatan Beton untuk Meningkatkan Kekuatan Pada Umur Setelah 28 Hari*, S1 Teknik Sipil Universitas Islam Indonesia.
- Artioli, G. & Bullard, J.W., 2013, Cement hydration: the role of adsorption and crystal growth. *Crystal Research and Technology*, 48: 903-918.
- Badan Standardisasi Nasional, 1992, Spesifikasi Beton Bertulang Kedap Air, *Standar Nasional Indonesia SNI 03-2914-1992*, 1-13.
- Badan Standardisasi Nasional, 2012, Tata Cara Pemilihan Campuran Beton Normal, Beton Berat dan Beton Massa, *Standar Nasional Indonesia SNI 7656:2012*, 1-43.
- Bensted, J., 1976, Uses of Raman Spectroscopy in Cement Chemistry. *Journal of the American Ceramic Society*, 59: 140-143.
- Black, L., Breen, C., Yarwood, J., Deng, C.S., Phipps, J., & Maitland, G., 2006, Hydration of tricalcium aluminate (C3A) in the presence and absence of gypsum-studied by Raman spectroscopy and X-ray diffraction, *J. Mater. Chem.* 16 (13) 1263-1272.
- Buzgar, N. & Apopei, A., 2009, The Raman study of certain carbonates. *Anal. Șt. Univ. „Al. I. Cuza” Iași. LV.* 97-112.
- DeLaine, J., 1997, The Baths of Caracalla; A Study in The Design, Construction, and Economics of Large-Scale Building Projects in Imperial Rome. *Journal of Roman Archaeology*, Suppl. 25, Portsmouth, R.I.
- Donnelly, F. C., Purcell-Milton, F., Framont, V., Cleary, O., Dunne, P. W., & Gun'ko, Y. K., 2017. Synthesis of CaCO<sub>3</sub> nano-and micro-particles by dry ice carbonation. *Chemical Communications*, 53(49), 6657-6660.
- Edwards, H. G., Villar, S. E. J., Jehlicka, J., & Munshi, T., 2005, FT-Raman spectroscopic study of calcium-rich and magnesium-rich carbonate minerals. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 61(10), 2273-2280.
- Franguelli, F.P., Barta-Holló, B., Petruševski, V.M., Sajó, I.E., Klébert, S., Farkas, A., Bódis, E., Szilágyi, I.M., Pawar, R.P. and Kótai, L., 2021. Thermal decomposition and spectral characterization of di [carbonatotetraamminecobalt (III)] sulfate trihydrate and the nature of its thermal decomposition products. *Journal of Thermal Analysis and Calorimetry*, 145, 2907-2923.
- Garbev, K., Stemmermann, P., Black, L., Breen, C., Yarwood, J. and Gasharova, B., 2007. Structural features of C-S-H (I) and its carbonation in air—a

- Raman spectroscopic study. Part I: fresh phases. *Journal of the American Ceramic Society*, 90(3), pp.900-907.
- Garg, N., 2012. Raman spectroscopy for characterizing and determining the *pozzolanic* reactivity of fly ashes (Doctoral dissertation, Iowa State University).
- Gunasekaran, S., Anbalagan, G. and Pandi, S., 2006. Raman and infrared spectra of carbonates of *calcite* structure. *Journal of Raman Spectroscopy: An International Journal for Original Work in all Aspects of Raman Spectroscopy, Including Higher Order Processes, and also Brillouin and Rayleigh Scattering*, 37(9), pp.892-899.
- Halliday, D., Resnick, R. & Walker, J., 2011, *Fundamentals of Physics—9<sup>th</sup> edition*, USA: Wiley.
- Hickstein, D.D., Goldfarbmuren, R., Darrah, J., Erickson, L. & Johnson, L.A., 2018, Rapid, accurate, and precise concentration measurements of a methanol–water mixture using Raman spectroscopy. *OSA Continuum*, 1, 1097-1110.
- Hossain, K.M., 2005. Performance of volcanic ash based precast and in situ blended cement concretes in marine environment. *Journal of materials in civil engineering*, 17(6), pp.694-702.
- Ibáñez, J., Artús, L., Cuscó, R., López, Á., Menéndez, E. and Andrade, M.C., 2007. Hydration and carbonation of monoclinic C2S and C3S studied by Raman spectroscopy. *Journal of Raman Spectroscopy: An International Journal for Original Work in all Aspects of Raman Spectroscopy, Including Higher Order Processes, and also Brillouin and Rayleigh Scattering*, 38(1), pp.61-67.
- Irawan, R. R., 2013, *Semen Portland di Indonesia untuk Aplikasi Beton Kinerja Tinggi*, Bandung: Pusat Penelitian dan Pengembangan Jalan dan Jembatan.
- Ivleva, N.P., Huckele, S., Weinzierl, B., Niessner, R., Haisch, C. and Baumann, T., 2013. Identification and characterization of individual airborne volcanic ash particles by Raman microspectroscopy. *Analytical and bioanalytical chemistry*, 405, pp.9071-9084.
- Jackson, M.D., Chae, S.R., Mulcahy, S. R., Meral, C., Taylor, R., Li, P., Emwas, A. H., Moon, J., Yoon, S., Vola, G., Wenk, H. R. & Monteiro, P.J., 2013. Unlocking the Secrets of *Al-tobermorite* in Roman Seawater Concrete. *American Mineralogist*, 98, 1669-1687.
- Jackson, M.D., Mulcahy, S.R., Chen, H., Li, Y., Li, Q., Cappelletti, P & Wenk, H.R., 2017, *Phillipsite and Al-tobermorite Mineral Cements Produced Through Low-Temperature Water-Rock Reactions in Roman Marine Concrete*. *American Mineralogist*, 102, 1435-1450.

- Khalis, A., 2016, *Kajian Abu Vulkanik Gunung Kelud sebagai Alternatif Bahan Penyusun Batako Berlubang*, S1 Teknik Sipil Universitas Brawijaya.
- Kirkpatrick, R.J., Yarger, J.L., McMillan, P.F., Ping, Y. and Cong, X., 1997. Raman spectroscopy of CSH, tobermorite, and jennite. *Advanced Cement Based Materials*, 5(3-4), pp.93-99.
- Kupwade-Patil, K., Al-Aibani, A.F., Abdulsalam, M. F., Mao, C., Bumajdad, A., Palkovic, D. S. & Büyüköztürk, O., 2016, Microstructure of Cement Paste with Natural *Pozzolan*ic Volcanic Ash and Portland Cement at Different Stages of Curing, *Construction and Building Materials*, 113, 423-441.
- Kupwade-Patil, K., Chin, S.H., Johnston, M.L., Maragh, J., Masic, A. and Büyüköztürk, O., 2018. Particle size effect of volcanic ash towards developing engineered Portland cements. *Journal of Materials in Civil Engineering*, 30(8), p.04018190.
- Li, J., Zhang, W., Garbev, K., Beuchle, G. & Monteiro, P.J., 2020, Influences of Cross-Linking and Al Incorporation on the Intrinsic Mechanical Properties of Tobermorite. *Cement and Concrete Research*, 136, 1-7.
- Maragh, J.M., Weaver, J.C. & Masic, A., 2019, Large-Scale Micron-Order 3D Surface Correlative Chemical Imaging of Ancient Roman Concrete, *PLoS ONE* 14(2): e0210710.
- Masmoudi, R., Kupwade-Patil, K., Bumajdad, A. & Büyüköztürk, O., 2017, In Situ Raman Studies on Cement Paste Prepared with Natural *Pozzolan*ic Volcanic Ash and Ordinary Portland Cement, *Construction and Building Materials*, 148, 444-454.
- Mather, B., 1964. Effects of sea water on concrete (No. AEWES-Misc-Pap 6-690). Army Engineer Waterways Experiment Station.
- Oleson, J. P., Brandon, C., Cramer, S. M., Gotti, R. C., Cucitore, R. & Hohlfelder R. L., 2004, The ROMACONS Project: a Contribution to the Historical and Engineering Analysis of Hydraulic Concrete in Roman Maritime Structures, *The International Journal of Nautical Archaeology*, 33, 199-229.
- Oleson, J.P., Jackson, M.D., Hohlfelder, R.L. and Brandon, C.J., 2014, Building for eternity: the history and technology of Roman concrete engineering in the sea. *Building for Eternity*, pp.1-368.
- Pacewska, B. & Wilińska, I., 2020, Usage of Supplementary Cementitious Materials: Advantages and Limitations, *Journal of Thermal Analysis and Calorimetry*, 142, 371-393.
- Rahmawati, S., Jumaeri, Prasetya, A. T., 2019, Pengaruh Penggunaan Zeolit Alam sebagai Pengikat Impuritas pada Pembuatan Garam, *Indonesian Journal of Chemical Science*, 8, 141-146.

- Rulian, N. F. & Saelan, P., 2020, Kajian Batasan Nilai Faktor Air Semen pada Campuran Beton di Lingkungan Korosif, *RekaRacana: Jurnal Teknik Sipil*, 6, 123-131.
- Satria, F., 2020, *Analisis Penguatan Beton (Concrete Reinforcement) Oleh Mineral Al-tobermorite Dan Philipsite Pada Pasta Beton Berbahan Abu Vulkanik Dan Terpapar Air Laut*, S1 Fisika Universitas Gadjah Mada.
- Smith, E. & Dent, G., 2005, *Modern Raman Spectroscopy—A Practical Approach*, England: Wiley.
- Snellings, R., 2015, Surface chemistry of calcium aluminosilicate glasses. *Journal of the American Ceramic Society*, 98, 303-314.
- Taylor, H.F.W., 1992, Tobermorite, Jennite, and Cement Gel. *Zeitschrift fur Kristallographie - New Crystal Structures*, 202, 41-50.
- Tjokrodimuljo, K., 1996, *Teknologi Beton*, Yogyakarta: Jurusan Teknik Sipil, Fakultas Teknik Universitas Gadjah Mada.
- Tsai, Y.L., Huang, E., Li, Y.H., Hung, H.T., Jiang, J.H., Liu, T.C., Fang, J.N. and Chen, H.F., 2021. Raman spectroscopic characteristics of zeolite group minerals. *Minerals*, 11(2), p.167.
- Utari, N. P. S. N., Sudiarta, I. W. & Suarya, P., 2020, Sintesis dan Karakterisasi Silika Gel dari Abu Vulkanik Gunung Agung Melalui Teknik Sol-Gel, *Jurnal Kimia (Journal of Chemistry)*, 14, 30-36.
- Utomo, M.F. and Setiawan, I.B., 2022. Tinjauan Perilaku Beton Menggunakan Serbuk Kapur Tohor Sebagai Substitusi Semen (Doctoral dissertation, Universitas Muhammadiyah Surakarta).
- Vola, G., Gotti, E., Brandon, C., Oleson, J.P. & Hohlfelder, R.L, 2011, Chemical, Mineralogical and Petrographic Characterization of Roman Ancient Hydraulic. Concretes Cores from Santa Liberata, Italy, and Caesarea Palestinae, Israel. *Periodico di Mineralogia*, 80, 317-338.
- Yuswanto, S. P & Pramudiyanto, 2015, Pengaruh Penambahan Abu Vulkanik Gunung Kelud Terhadap Kuat Tekan Beton, *INERSIA*, 11, 95-104.
- Wahyuni, E.I., Triyono, S. and Suherman, M., 2012. Penentuan Komposisi Kimia Abu Vulkanik dari Erupsi gunung Merapi. *Jurnal Malusia dan Lingkungan*, 19(2).
- Wegian, F.M., 2010, Effect of seawater for mixing and curing on structural concrete. *The IES Journal Part A: Civil & Structural Engineering*, 3(4), pp.235-243.