Thermal influence on physico-chemical properties of metakaolin/organic-based geopolymers

M. Catauro[1], A. D'Angelo[1], S. Piccolella[2], C. Leonelli[3] and G. Dal Poggetto[3*]
[1] University of Campania "Luigi Vanvitelli", Department of Engineering, Via Roma n. 29-81031 Aversa, Italy, michelina.catauro@unicampania.it, antonio.dangelo@unicampania.it
[2] University of Campania "Luigi Vanvitelli", Department of Environmental, Biological and Pharmaceutical Sciences and Technologies, Via Vivaldi 43-81100 Caserta, Italy, simona.piccolella@unicampania.i
[3]University of Modena and Reggio Emilia, Department of Engineering "Enzo Ferrari", Via P. Vivarelli n. 10- 41125 Modena, Italy, cristina.leonelli@unimore.it, giovanni.dalpoggetto@unimore.it

**corresponding author: giovanni.dalpoggetto@unimore.it*

Keywords. organic waste, FT-IR, metakaolin, alkali activation, antibacterial properties

Abstract.
The high amount of organic and inorganic wastes has increased the attention to new strategies aiming to reduce the waste disposals. Among the different technologies, the geopolymers had been proposed as a powerful technology able to incorporate various kind of wastes [1]. Pure metakaolin and a mixture obtained by adding 10% of tomato waste-derived were consolidated by alkali activation at room temperature, 40 and 60°C. FT-IR spectra confirmed the geopolymerization occurrences. Conductivity and pH were evaluated at different time. The integrity tests assessed the resistance of the synthesized geopolymers and the presence of tomato-wastes led to a release of yellow organic hydro-soluble compound. Weight loss confirmed the integrity test, indeed there were no differences at 16 and 30 days. Finally, the antibacterial properties of the synthesized geopolymers were investigated [2].

References

[1] H.K. Tchakouté, C.H. Rüscher, S. Kong, E. Kamseu, C. Leonelli, Constr Build Mater. 2016, 114, 276 – 289
[2] G. Dal Poggetto, M. Catauro, G. Crescente, C. Leonelli, Polymer. 2021, 13, 1493