

Study of nano-based antiviral coatings on concrete specimens

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The present paper reports an inside look into the synthesis of different doped TiO₂ photocatalysts supported on zeolite or graphene, in order to obtain surfaces able to inactivate and eliminate COVID-19 by photocatalysis under UV-A [1]. Throughout various combinations of raw materials and their amounts, eight different nanocomposites of metal-doped titanium dioxide coupled with graphene or zeolite are synthesized to investigate their photocatalytic properties [2]. By using concrete specimen molds, concrete cubes are obtained and a nanocoating of photocatalytic thin-films is applied. SEM-EDX analysis was performed for all photocatalytic composites. Physical-chemical characterization of the raw materials, like fly ash and zeolites, is conducted by using SEM, XRD, and XRF [3].

Keywords: Photocatalysts, COVID-19, Antiviral activity, Concrete cube, Nanocoating.

References

- [1] MaryamAzizi-Lalabadi, Ali Ehsani, Baharak Divband, MahmoodAlizadeh-Sani. Antimicrobial activity of Titanium dioxide and Zinc oxide nanoparticles supported in 4A zeolite and evaluation the morphological characteristic Scientific Reports. (2019) 9:17439 | <https://doi.org/10.1038/s41598-019-54025-0>
- [2] Khalid, N. R., Ahmed, E., Hong, Z., Ahmad, M., Zhang, Y., & Khalid, S. (2013). Cu-doped TiO₂ nanoparticles/graphene composites for efficient visible-light photocatalysis. *Ceramics International*, 39(6), 7107-7113. <https://doi.org/10.1016/j.ceramint.2013.02.051>
- [3] Gjyli S, Korpa A, (2021). High catalytic activity of a sea water fly ash-based zeolite for phenol alkylation. *Kinetics and Catalysis*. 62, 2, 270–278. *Russian Text*, 2021, 62, 2, 214–223 DOI: 10.1134/S0023158421020038

Figures

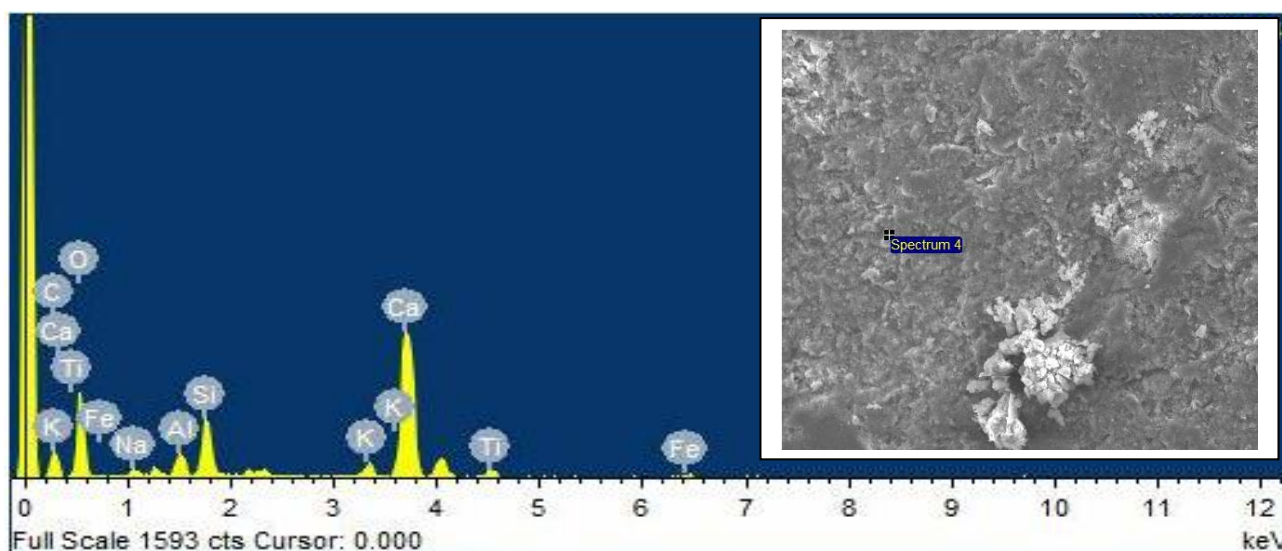


Figure 1: SEM-EDX analysis of TiO₂/ZXD nanopowder