

YOURS 2022

ABSTRACT PROCEEDINGS

YOUng researcheRS conference 2022

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Editorial board of ~~Journal~~ of applied engineering science

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Antibacterial activity of amine-functionalized silver-enriched beta zeolite

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Zeolites are inorganic, crystalline aluminosilicates that nowadays has been used as adsorbents, catalysts and carriers of catalytically activated substances, due to the small size of their pores, large internal surface, and well-defined chemical composition. In this paper, the modification of beta zeolite using (3-aminopropyl)-triethoxysilane (APTES) was investigated. The results of the Fourier transform infrared spectroscopy and thermogravimetric analysis confirmed the presence of amino groups derived from APTES onto the modified zeolite surface. APTES-enriched zeolite was further used as an adsorbent of silver ions from aqueous solutions. The obtained results reveal that a zeolite after modification exhibited significantly better adsorption efficiency (97%) in comparison to the unmodified (37%). The kinetic data follows the pseudo-second-order model which indicates a chemical interaction between silver ions and functional amino groups on the surface of the silanized beta zeolite. Ag-APTES enriched beta zeolite also was studied as an antibacterial agent toward the pathogenic bacteria Gram-negative *Escherichia coli* DSM 498 and Gram-positive *Staphylococcus aureus* ATCC 25923.

Keywords: beta zeolite, aminosilane, modification, silver ions, antibacterial activity

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