

Silver loaded zeolites and investigation of their antimicrobial activity

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Clinoptilolite, microporous zeolite can be used for dispersion of Ag⁺ activity having permanent removal of coliform bacteria normally found in natural water. Findings of the clinoptilolite antibacterial effect of Ag⁺ nanoparticles/clinoptilolite was made from two bacteria: *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 25923.

To guarantee the microbiological quality of the water, which is been affected by the pollution of the bacterium, is necessary to implement a tertiary drinking system in the resident houses. A possible complementary system is the utilization of clinoptilolite for treatment of drinking water [1,2].

Modification of natural zeolite was carried out under various conditions with H₂C₂O₄ (P_a) and NaOH (P_b), respectively (with a liquid/solid ratio of 5:1). After treatment, the solids were vacuum filtered, washed several times with deionised water and dried at 105°C for 6 hours. The second stage consists of the obtaining of the Ag⁺ (P₁-P_b treated with AgNO₃, P₂-P_a treated with AgNO₃) modified clinoptilolite.

After preparing inoculum and culture media, zeolitic species were put in contact with the surface agarizat environment. After 24 hours of incubation was followed by inhibition of bacterial growth phenomenon by the appearance of lysis zones around clinoptilolite with Ag⁺ nanoparticles clinoptilolite (Fig.1 and 2).



Fig.1:Antibacterial test results using *Escherichia coli* ATCC 25922 (P₁-P_b treated with AgNO₃, P₂-P_a treated with AgNO₃).



Fig.2: Antibacterial test results using *Staphylococcus aureus* ATCC 25923 (P₁-P_b treated with AgNO₃, P₂-P_a treated with AgNO₃).

References

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