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Antimicrobial properties of ZSM-5 type zeolite functionalized with silver

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Abstract

Antimicrobial properties of high SiO₂/Al₂O₃ ratio zeolites functionalized with silver have been scarcely reported in the literature. The antimicrobial properties of the ZSM-5 type zeolite functionalized with Ag⁺ ions were evaluated using culture media by placing in contact the resultant zeolite with the *Escherichia coli*, *Pseudomonas aeruginosa* bacteria and the *Candida albicans* fungus. The effect of the time on bactericidal activity was examined with a kinetic study carried out to analyze the microorganism growth. The results indicated that this functionalized zeolite inhibits the bacteria and fungus proliferation.

Keywords

Zeolite, ZSM-5, antibacterial, antifungal, silver

1. Introduction

The development of resistance to antibiotics and disinfectants, the occurrence of adverse effects caused by the use of conventional antibacterial agents, has led scientists to look for new antibacterial agents. Silver is one of the strongest antibacterial agents, and has been known for its antibacterial activity since the times of ancient Greece^[1].

The use of silver in medicine is growing, due to its broad spectrum of bacteria and fungi inhibition^[2]. It can be used to prevent wound colonization and for wound dressing^[3], and to prevent bacterial colonization on medical devices^[4].

In recent years, there has been renewed interest by researchers to novel types of safe and cost-effective antibacterial materials; as silver-based nanoparticles^[5]. Zeolites are porous

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