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ABSTRACT BOOK

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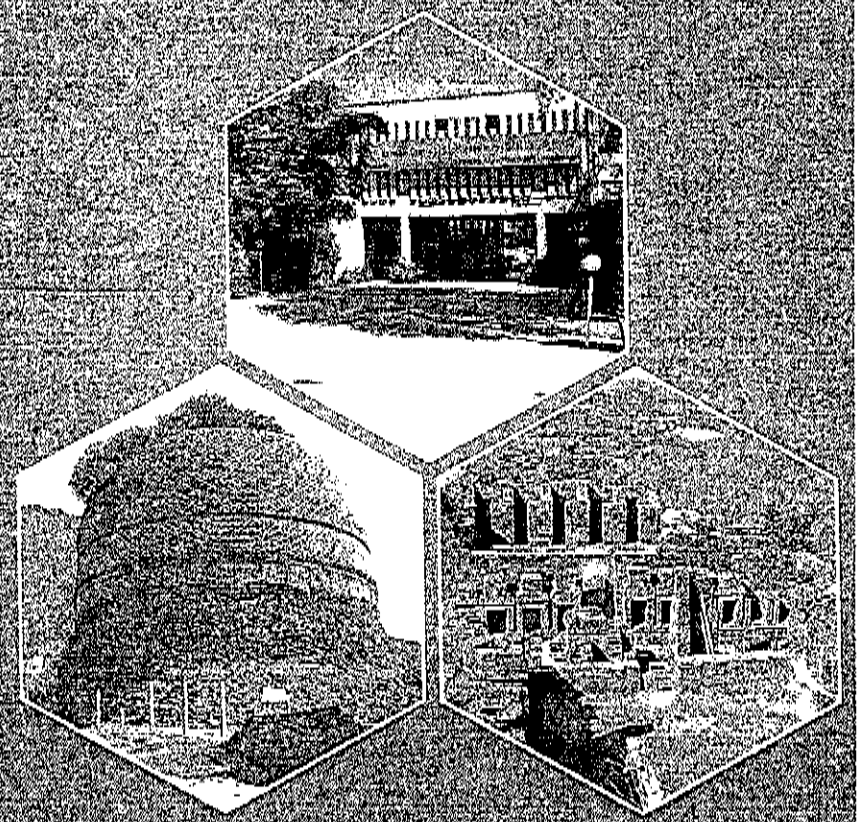

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Influence of pH and Temperature on Oxidative Degradation of Antibiotic Sulfamethoxazole

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Absract:

Recently, contamination of the environment by pharmaceuticals and remediation of such pollutants has received considerable attention. Within the last few years, an increasing number of studies have focused on antibiotic degradation using various advance oxidation processes. This study aims the influence of pH and temperature on oxidative degradation and mineralization of a widely used antibiotic, Sulfamethoxazole (SMX), by Fenton process. The experiments were conducted in a laboratory-scale batch reactor. The effect of different experimental parameters such as pH, temperature and initial pollutant concentration on the degradation and total organic carbon (TOC) removal of SMX was studied. The acidic pH favors the degradation and mineralization of SMX. The process is enhanced by increasing the temperature. Maximum degradation and TOC removal was achieved within 10 and 120 minutes, respectively, at pH 3.0 and 35 oC. The degradation of SMX by this process was found to follow pseudo-first order reaction kinetics. The results indicated that SMX could be completely degraded and efficiently mineralized using Fenton process in acidic condition at temperature 25-35 oC.

Sol gel Synthesis of Layered Inorganic-organic Hybrid Material based on Mg-Phyllosilicate for Toxic Metals Sorption

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Abstract:

The layered hybrids materials are usually synthesized from one step sol-gel route. An interesting feature associated with these hybrid materials is the presence of organic functionalities distributed the interlayer cavities. Such kind of materials are useful in different fields e.g. as metal ion extractions, chromatographic determinations, catalysis etc. The synthesis of hybrid was based on magnesium-phyllosilicate model, in which pendant chains have nitrogen atoms, act as chelating agents for cation complexing from aqueous solutions. A silylating agent was prepared by the reaction of 3-aminopropyltrimethoxysilane and acrylonitrile in the presence of methanol. This silylating agent reacted with $Mg(NO_3)_2.6H_2O$ in methanol by sol-gel process, to lead to the formation of layered Magnesium-phyllosilicate hybrid

The IR spectra showed typical stretching from both inorganic and organic moieties at 1034 and 1131 cm^{-1} due to Si-O-Si and 2930 cm^{-1} for CH stretching of organic moiety. Bands at 518 cm^{-1} and 2239 cm^{-1} were attributed to Mg-O and C≡N group, respectively. Solid-state ^{13}C NMR spectrum showed signal at 120 ppm, which is attributed to the carbon of C≡N group. For ^{29}Si, the signal were assigned to T^3 [$RSi(OSi)_3$], T^2 [$(RSi(OSi)_2(OH)$] and T^1 [$(RSi(OSi)(OH)_2$] at –68 ppm, -56 ppm and –48 ppm, respectively, confirming the bonding of organic moiety to the inorganic backbone. The XRD shows a peak in the 001 plane at $2\Theta = 4.70^0$ and 060 plane at 60^0, confirming the phyllosilicate structure. The materials were tested for removal of toxic metals from aqueous solutions.