

2nd International Conference on

Nanostructured Materials & Nanochemistry

November 02-03, 2018 | San Francisco, USA

Boron nitride nanomaterials: An effective and upcoming approach for water purification

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Organic pollutants in the aquatic systems are the emerging class of contaminants owing to their prevalence and high stability. In this regard, promising nanomaterial i.e. boron nitride (BN) nanomaterials have been fabricated by adopting solid-state high-temperature annealing methods, characterized using various techniques including Fourier transform infrared spectroscopy, X-ray diffraction technique and high-resolution transmission electron microscopy and then explored towards the adsorption applications. To elucidate their brilliant adsorbent properties, a variety of toxic organic pollutants consisting dyes and pharmaceutical wastage have been taken into consideration as adsorbates. In the present study, critical investigation on the adsorption of fluoroquinolone antibiotic over the surface of BN nanomaterials has been carried out. Effect of various experimental parameters on the extent of adsorption such as contact time, pH, adsorbent dosage and initial antibiotic concentration has also been explored. Furthermore, to demonstrate the nature of adsorption, adsorption isotherm; Langmuir and Freundlich's isotherms have also been studied. Subsequently, the kinetic analysis including the calculation of rate constant has also been accomplished by incorporating the kinetic models. Results obtained from this work demonstrated that BN nanomaterials are very efficacious adsorbents for the removal of antibiotics from water and might also be used in drug delivery systems.

Biography

Preeti Singla has completed PhD last year in the field of Nanochemistry and Theoretical chemistry from the department of chemistry, Panjab University, Chandigarh, India. Recently, looking forward to the postdoctoral studies in the USA. Her research is focused on the synthesis, characterization and application of nanomaterials both experimentally and theoretically. She had published 10 papers in peer-reviewed journals.

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