

Use of Modified Bagasse Fly Ash, an Agriculture Waste for Enhancing Phenol Uptake from the Aqueous Solution

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ABSTRACT

Last few years researchers have gained success to some extent in developing inexpensive adsorbent for water pollution control utilizing naturally available and industrial waste materials. However, still there is a need to find out the practical utility of such developed adsorbent on large scale and at the same to establish an Eco-friendly system of disposal of spent adsorbents. Bagasse fly ash is the major solid waste byproduct of agro-based sugar industries, which is used as cementing and pavement material, land filling material etc. It can be used as an adsorbent for the removal of contaminants from the waste water. Our aim was to find out the proper way to utilize Bagasse Fly Ash (BFA) as a potential adsorbent by synthesizing Zeolite (ZBFA) from Bagasse fly ash. Low cost, abundantly available fly ash with alkaline hydrothermal treatment was examined as a potential sorbent for the removal of phenols by mode of batch operation. Untreated, treated and adsorbed sorbent was characterized by FTIR, Powder X-ray diffraction, XRF, Thermo gravimetric analysis, Scanning Electron Microscopy methods. Synthesized zeolite and virgin BFA were examined for the removal of phenol from the aqueous solution. The effects of various parameters such as shaking time, hydronium ion concentration, sorbent dose, initial phenol concentration and temperature on the sorption process were studied. Thermodynamic parameters for sorption process were evaluated by Freundlich and Langmuir isotherms. The material appeared to perform quite well.