Adsorption study of ammonia nitrogen by watermelon rind

Abstract

The utilization of fruit waste for low-cost adsorbents as a replacement for costly conventional methods of removing ammonia nitrogen from wastewater has been reviewed. The adsorption studies were conducted as a function of contact time and adsorbent dosage and it were carried out on four different adsorbents; fresh watermelon rind and modified watermelon rind with sodium hydroxide (NaOH), potassium hydroxide (KOH) and sulphuric acid (H_2SO_4). Adsorbents were tested for characterization by using zeta potential test and all samples shows negative values thus makes it favourable for the adsorption process. The batch experimental result showed that adsorption process is rapid and equilibrium was established within 40 minutes of contact time. The ammonia nitrogen removal rate amounted in range of 96% to 99%, and the adsorption capacities were in range of 1.21 to 1.24 mg/g for all four different types of adsorbents used.