عنوان مقاله:

Application of Chitosan and Activated Carbon Nano-composite in Removal of Nitrite, Phosphate, and Ammonia From Aquaculture Wastewater

محل انتشار:

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خلاصه مقاله:

Developing an adsorbent with natural components is one of the effective methods to reduce the amount of wastewater pollutants. Wastewater reuse can improve the quality of water prior to entering the natural environment. The aim of this study was to evaluate the efficiency of chitosan nano-composite and activated carbon adsorbent in the removal of nitrite, phosphate, and ammonia pollutants from fish farms of Aq-Qala. To prepare the adsorbents, the shrimp shells were converted to nano-chitosan. The date palm kernel was prepared and activated with oxalic acid in pyrolysis furnace by injecting nitrogen gas into activated carbon, then, the nano-composite was prepared from nano-chitosan and activated carbon. A field-laboratory study was conducted during the winter of ۲۰۱۸, and then, batches of synthesized nano-composite were investigated and the effects of pH, initial effluent concentration, and adsorption time were investigated. The experiments were performed in the pH range of ۵-۸, effluent concentration of ۲۵-۱۰۰ mg/L, and contact time of ۱۵-۹۰ minutes. The results showed that at optimum conditions (pH of ۷, effluent concentration of ۵۰ mg/L, and contact time of ۶۰ minutes), the highest removal percentage and adsorption capacity for nitrite, phosphate, and ammonia contaminants were ۹۹.۹۸%, ۹۹.۷۷%, and ۶۵.۶۵%, and ۶.۶۵, ۶.۱۴, and ۷.۳۲ mg/g , respectively. Due to the high removal percentage (۹۹.۹۸%) of the chitosan and activated carbon nano-composite, the adsorbent was highly capable of removing pollutants (nitrite, phosphate, and ammonia).

کلمات کلیدی:

Adsorbent, Activated carbon, Nano-composite, Wastewater, Chitosan