

Abstract

This paper reports on the preparation and modification of powdered maize tassels with polydiallyldimethylammonium chloride (polyDADMAC). The modified tassel were applied for the removal of phenolic compounds from water, through adsorption. The effect of contact time, sorbent dose, pH of the sample and the adsorption capacity were investigated at fixed temperature (25 °C). The optimum pH was 6.0 and the uptake was more than 90% within the first 10 min of contact. The adsorption prescribed to Langmuir model of monolayer adsorption implying a chemisorption process. The adsorption capacities were found to be 7.09, 8.23, 8.84 and 4.74 mg g⁻¹ for chlorobenzoic acid, 2,4,6-trichlorophenol, 2,4-dichlorophenol and 1,2-dihydroxybenzene respectively. These were fairly higher than many other reported systems. The removal efficiency was found to be 75, 64, 55 and 40% for Chlorobenzoic acid, 2,4,6-Trichlorophenol, 2,4-dichlorophenol and 1,2-dihydroxybenzene, respectively. This proved that quaternised maize tassels can be used as an efficient adsorbent material for removal of phenolic compounds from water and wastewater.