

## The Application of Cellulose-Based Halloysite-Carbon Adsorbent to Remove Chloroxylenol from Water

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**Abstract :** Chloroxylenol is a common ingredient in disinfectants. Due to the use of this compound in large amounts, it is more and more often detected in rivers, sewage, and also in human body fluids. In recent years, there have been concerns about the potentially harmful effects of chloroxylenol on human health and the environment. This paper presents the synthesis, a brief characterization and the use of a halloysite-carbon adsorbent for the removal of chloroxylenol from water. The template in the halloysite-carbon adsorbent was acid treated bleached halloysite, and the carbon precursor was cellulose dissolved in zinc (II) chloride, which was dissolved in 37% hydrochloric acid. The FTIR spectra before and after the adsorption process allowed to determine the presence of functional groups, bonds in the halloysite-carbon composite, and the binding mechanism of the adsorbent and adsorbate. The morphology of the bleached halloysite sample and the sample of the halloysite-carbon adsorbent were characterized by scanning electron microscopy (SEM) with surface analysis by X-ray dispersion spectrometry (EDS). The specific surface area, total pore volume and mesopore and micropore volume were determined using the ASAP 2020 volumetric adsorption analyzer. Total carbon and total organic carbon were determined for the halloysite-carbon adsorbent. The halloysite-carbon adsorbent was used to remove chloroxylenol from water. The degree of removal of chloroxylenol from water using the halloysite-carbon adsorbent was about 90%. Adsorption studies show that the halloysite-carbon composite can be used as an effective adsorbent for removing chloroxylenol from water.

**Keywords :** adsorption, cellulose, chloroxylenol, halloysite

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