Use of a Polymer Derived from Citrus sinensis Peel to Remove Heavy Metals Dissolved in Water such as Hexavalent Chromium

Colon, Marisabel

The purpose of this research is to use the Citrus sinensis peel to develop a polymer capable of adsorbing and retaining heavy metals dissolved in water such as the hexavalent chromium which is highly toxic. The hypothesis was that if the polymer formed from the peel of Citrus sinensis has the capacity to absorb and retain, then it can be used to remove dissolved metals such as Cr (VI) in a sample of water. To prepare the polymer the orange peels were dried, crushed and mixed with NaOH to prepare their surface. The prepared orange peels were mixed with CaCl2 to stabilize them and favor the adsorption process. For the calibration curve, 5 standards were prepared from 0.05 to 1 mL using potassium dichromate. The colorimetry technique was used, for which 1.5 diphenylcarbazide and sulfuric acid were used. When the 1.5 diphenylcarbazide comes in contact with the chromium a red-violet compound was formed. To determine the polymer effectivity, the adsorbance of 0.50mL a chromium solution was measured and then another sample of 0.50 mL was agitated with 4gm of the polymer for 2 hrs. The filtrate went through the same processes as the standards. The sample that was not in contact with the polymer had an adsorbance of 3.124 and the sample that was in contact with the polymer had an adsorbance of 2.42. From the regression line obtained from the calibration curve it was verified that the polymer had a 28% removal of chromium. Therefore the hypothesis is accepted.

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