

Removal of Chromophore Chemical Species Present in a Real Industrial Effluent using Activated Carbons

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Abstract

Four commercial activated carbons with different shapes, origins and characteristics (Norit Azo, Merck granular, DCL GDC 753 and X2MH 6/8) were tested for the removal of the chromophore compounds present in a pulp mill effluent using batch and dynamic trials. The colour removal achieved in the batch trials was within the range 30-95%. We can also conclude that the iodine index can be used as a guide for the effluent colour removal efficiency and that the adsorption is proportional to the point of zero charge and micropore volume of the samples. The breakthrough curves reveal that X2MH 6/8 has a very fast saturation while the DCL and Merck samples have good efficiency with 90% colour removal when the effluent volume that passes through the column is 5 and 10 times the activated carbon volume, respectively. The activated carbon adsorption also has a significant positive impact on other important parameters, namely adsorbable organic halides, nitrogen and phosphorous concentration and dissolved oxygen content.

Keywords

Activated carbon, colour removal, liquid phase adsorption, industrial effluent, pollution prevention.