

COLOUR AND COD CONTROL OF DYE WASTEWATER USING DIFFERENT ADSORPTION MATERIALS

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The wastewater from dyes and their intermediate manufacturing industry causes serious impact on natural water bodies and land surfaces in the surrounding area. The dye wastewater is treated by using many effective physical, chemical or biological techniques in the world. High values of COD and BOD, presence of particulate matter and sediments that give intense color intensity and turbidity in the effluents are some factors leading into the depletion of DO. There are five dyeing cottage industries in operation at Maruthamunai and above mentioned problems are noticed to be occurring in that area. In this part of study, we used different materials with the objective to select some efficient ones to control the COD and the colour intensity of the wastewater by adsorption from one of those dyeing industries. Dye wastewater parameters, such as pH, EC, colour intensity, and COD were analysed by using HACH multi-parameter, pH and conductivity meter, spectrophotometer (HACH, DR 2010) and titrimetric methods, respectively before and after the treatments with the different materials. Oxidizing properties of H₂O₂ and adsorption properties of charcoal were used for treating dye wastewater in our work, in addition to different materials such as coal (from fire wood) paddy husk, saw dust, dry peel of ariconut, nirmali (*S. potatorum*) seeds, etc used. These results indicated that H₂O₂ oxidizes both organic and inorganic pollutants which contribute to COD. Adsorption was an effective process for decolourization of textile dyes. Although different materials were tried, activated carbon was the most effective adsorbent due to its high surface area. Using these two substances H₂O₂ and activated C, we were able to reduce the COD (60.2%.and 9.5%, respectively), pH (3.61%, and 2.61% respectively), EC (22.2%, and 5.3% respectively) and colour (88.33%, and 82.58% respectively) of dye wastewater. The results showed that the adsorption process using activated carbon insured a good degree of color reduction and chemical oxidation using H₂O₂ as oxidant allows the effective control of organic load, offensive odor and foaminess in domestic wastewater.

Keywords: Activated carbon, H₂O₂, Adsorption, COD, Colour intensity.