Retraction

Retraction: Removal of Textile Effluent dyes using Tunic of Allium Cepa (IOP Conf. Ser.: Mater. Sci. Eng. 1145 012031)

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This article (and all articles in the proceedings volume relating to the same conference) has been retracted by IOP Publishing following an extensive investigation in line with the COPE guidelines. This investigation has uncovered evidence of systematic manipulation of the publication process and considerable citation manipulation.

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IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the Problematic Paper Screener [1] for bringing some of the above issues to our attention, prompting us to investigate further.

[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:2107.06751v1

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Removal of Textile Effluent dyes using Tunic of Allium Cepa

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Abstract. Textile effluents are the one most calamitous threat to the environment, which have a lot of chronic effect towards the human beings. Colour is the main experimental variable to recognize the water has contaminated. Out of many techniques, Adsorption is attaining a specific place of importance due to its scope choosing naturally available materials. Activated Carbon from Tunic of Allium cepa (ACTAC) had been chosen as an Adsorbent, as it is abundantly available. ACTAC was used for optimization studies for the removal of selected dyes from the Textile effluents. The selected dyes are safranine, Indigoid, Alizarin Red S and Crystal violet belongs to the Azo and Anthraquinone family dyes respectively. These dyes are selected as they are not degradable easily and are very toxic in nature. The optimum percentage removal of selected dyes from the textile effluent was reported as 80, 70.95, 45 and 74 respectively.

1. Introduction

Material ventures is one of the biggest water burning-through businesses which delivery shaded wastewater containing colour become major socio-ecological effect because of water shortage, water tainting and steady effects. The profluent coming out from material businesses contains combination of colours, metals, COD/BOD and different poisons. It requires appropriate treatment before it is released into any water streams. Before any appropriate treatment the removal of waste water containing colours can hurt the amphibian creature and the climate. It is likewise unsafe to individuals as it brings about cancer-causing and mutagenic impacts which can cause unfavourably susceptible dermatitis, skin disturbance, malignancy and so forth ... The release of profoundly shaded effluents into any stream’s blocks light entrance [1].

The material ventures basically rely upon three kinds of texture like cellulose, protein and engineered. Colour is a hued substance which is synthetically securities to the substrate and it is traces all the way back to the Neolithic time frame [2]. The material fixing government enactment requested the material enterprises to get their profluent exclusive expectations. Colour was assessed to use for millennia back; it is around 18000 years prior. It likewise acquired loads of fame in material enterprises. The material enterprises in by and large Tamil Nadu contain four significant kinds of colour in gushing specifically Safranin, Indigoid, Alizarin red S and Crystal violet [3].

These days, various strategies like organic treatment, Nano filtration, oxidation measure, particle trades, ozonation, ultrafiltration, coagulation and so forth have been read for the treatment of colours from the material gushing. The utilization of consolidated treatment strategy is utilized wherever in that the successful and effective technique is expulsion of colour utilizing adsorption technique [4].
Cost is a significant factor for contrasting the attainability of adsorbents in treating material emanating. An adsorbent is ordinarily supposed to be minimal effort on the off chance that it has small handling, bountiful in nature with high adsorption limit [5]. The utilization of adsorption in wastewater utilizing initiated carbon is utilized as often as possible by specialists and it remains very costly material. The most least expensive and compelling wellsprings of getting ready adsorbents like onion strip initiated carbon, banana strip-initiated carbon and need leaf powder enacted with zinc chloride arrangement carried by pyrolysis. Here it requires two techniques for handling adsorbents are physical and compound strategies. In actual technique adsorbent is treated by stove dry cycle and in synthetic strategy it is treated by adding any corrosive or soluble base to eliminate high fixation in adsorbent.

2. Literature Review

2.1. safranin Dye

Author [6], says that expulsion of safranin from watery arrangement utilizing Activated Hibiscus Sabdariffa Nano Carbon (AHSNC) in various structures has an extraordinary job the impact of evacuation of safranin in 50 mg/l at a temperature of 30 degree Celsius in a time of 50 min the adsorbent portion is 25mg/50ml and at lower focus, the proportion of the underlying number of colour atoms to the accessible surface zone is low.

Author [7], says the morphological portrayal of the soybean structure is a minimal effort and compelling adsorbent of safranin colour evacuation. The expulsion proficiency of safranin colour was discovered to be more prominent than 80%.

Author [8], says that expulsion of safranin from the gushing by adsorption strategy utilizing initiated onion strip (TAC) as adsorbent. Here the boundaries like pH – 4, temperature – 30 degree Celsius and contact time-120min are fixed.

Author [9], says that the safranin can be taken out from watery arrangements by adsorption utilizing pineapple strip . Here the ideal adsorption limit of 26.08mg/g was accomplished under the trial states of temperature and contact season of 6,293K and 80 min and the further examination uncovered that 93.24% of safranin color was taken out at 120mg/l color fixation in 80 min contact time.

Author [10], says that expulsion of safranin color from watery arrangement by adsorption technique utilizing attractive mesoporous dirt which is set up by synthetic precipitation was investigated thermodynamically. The monolayer adsorption limit was 18.48mg, g and its outcome was unconstrained and endothermic.

Author [11] says that the khulays characteristic bentonite is the best adsorbent used to eliminate safranin from waste water. The greatest adsorption limit was 294.1mg/g .

Author [12], all, says that the impacts of factors like pH, adsorbent measurements, MB fixation can be decreased utilizing supersonic-helped adsorption technique by utilizing adsorbent like Ferrosoferric oxide nanoparticle or iron oxide nanoparticles. The contact time on twofold colors expulsion eliminates safranin and methylene blue, the streamlined estimation of this technique was discovered to be 6, 0.01, 10 and 20.

2.2. Indigoid

Author [13], says that the expulsion of indigoid from material gushing by electrocoagulation utilizing aluminium anode .Here the CR(%) is 88.3 , color fixation is 12.32 mg/l with a current thickness of 2.81 Ampere per square meter, the arrangement grouping of NaCl is 2.67 g/l utilizing this strategy the lone hindrances isn’t monetary .

Author [14], says that expulsion of COD in indigoid colour utilizing electrochemical oxidation. In this he says that the color expulsion was accomplished in a brief timeframe of 16min at pH 2. It is seen that by applying a steady electrolysis of voltage between the platinum terminal is exceptionally compelling contrasted with different examinations.Author [15], says that removal of indigoid dye from waste water using different bedding media. The sand, gravel and zeolite are the bedding used in the
treatment of synthetic indigoid. This promising technique for purification of indigoid dying textile effluents of COD and colour as compared to conventional methods.

Author [16] says that the colour removal and COD removal from indigoid dye in wastewater using physic-chemical treatment is very effective. This method removes up to 99% of colour removal using FeSO4, alum, lime and polyelectrolyte at a dosage of 225, 225 and 1000 mg l-1. The colour removal efficiencies of dye are up to 97%, 97% and 95 %.

2.3. Alizarin Red S

Author [17] Mahmoud says about the Sorptive end of Alizarin Red S dye color from H2O utilizing citrulluslanatus strips in the earth generous route alongside balance information modeling. The greatest adsorption of the dye Alizarin Red S color subjected by citrulluslanatus strips is 76.60mg g-1 which is gotten at 0.3g adsorbent portion with forty min agitation time and pH of 2-4 with starting grouping of color 15mg l-1 at 40 ºC temperature. Author [18], says that the dye removal from watery media using the adsorbent alumina since it is nice for the ejection of the tones from liquid media for which the ideal conditions for the clearing of alizarin red s are 0.65g of adsorbent, 25 ppm of shading obsession at 30 ºc for 35 minutes contact time with 300 rpm agitation speed at pH of 1.0.

Author [19] says that Alizarin Red S ejection from watery media by using the adsorbent cynodon dactylon for which the ideal conditions for the clearing of are 0.6 g of adsorbent, 25ppm of shading obsession at 30ºc for an hour contact time with 300 rpm tumult speed at pH 1.0. Author [20], says that cyclic consecutive expulsion of Alizarin Red S color and chromium (VI) particles using wool as minimal effort adsorbent up to 93.3% under the state of pH is 2.0, 90 min as contact time, 8.0 g/l as adsorbent dosage at 25 ºC which shows that the evacuation relied upon the absorbate fixation and temperature and less relied upon the pH of arrangement.

Author [20] says that the evacuation of alizarin red s color from fluid arrangement by electrodecoagulation measure did in a cluster electrochemical cell with aluminum terminals in a monopolar association with watery arrangement of alizarin red s color. It was seen that increment in evacuation of ars color (93.5%) was gotten with lessening of starting convergence of color (5ppm) and expulsion of 97% was found with increment in current force (5a) [17]. Nonetheless, with the increment in electrolyte fixation the expulsion rate expanded from 76.77% to 79.89% which is practically unimportant and the expulsion level of ars diminished from 95.5% to 69.77% with entomb terminal separation from 0.6 cm to 2.4cm.

Author [21] says decolorization of the dye alizarin red s by bacterial strains with debasement productivity 68% and 72% for the species Escherichia coli and pseudomonas with ideal states of glucose 1%, peptone 1%, pH of 7 at 37ºc and 500 mg l color focus, blend of glucose 1% and peptone 1% and 50 bacterial cells which are immobilized for every mineral salt medium of 100 ml.

2.4. Crystal Violet

The clearing of valuable stone violet with the biosorption of CV using root powder of water hyacinth. The capacity of water hyacinth taken for the decolourization of CV. Effect of different limits like starting pH (2.0–10.0), shading fixation(100–500ppm), contact time (10–240min), biosorbent dose (0.5–5g/l), temperature (300–323K) on biosorption of CV were investigated. The most limit departure of shading seen at pH 7.8 and the biosorption measure has shown up at concordance at 120 min. The pinnacle biosorption limit was 322.58 mg/g, which is high when diverged from other bio sorbents.

The removal of pearl violet tone by adsorption using bentonite – alginate composite as an absorbant, the centralization of each manufactured in wastewater were 100 ppm, while for the jewel violet was 300 ppm. High percent departure of diamond violet shows that the composite (4B:5A) has a similar application in mechanical scale wastewater treatment.

The relevance of locally available and more affordable mixed spots of earth calcined and uncalcined is an adsorbent for the removal of diamond violet from the liquid plan. For uncalcined mixed soil, only 25% of CV is dispensed with by 0.05 g mass of the adsorbent, 0.8 g is required for complete removal. Because of calcined mixed earth, 94%removal of CV requires 0.05 g of the adsorbent, just 0.2 g is needed for the complete departure of CV tone. Considering the more
noteworthy adsorption breaking point of these mixed muds (calcined and uncalcined), it is contemplated that these materials could be used as an elective adsorbent to the expensive incited carbon for the removal of shadings from the liquid game plan.  

The valuable stone violet shading ejection from a liquid plan by Nano hydroxyapatite as a permeable. The Nano hydroxyapatite is prepared and investigated which has larger specific surface area of 81 meter per gram and smaller crystal size of 50 mm. The contact time, dosage pH, concentration where monitored. Lower the dosage higher the adsorption, higher the dosage lowers the adsorption. Thus, the better adsorbent of crystal violet is nano hydroxyapatite. With the obtained result the better adsorbent of crystal violet is nano hydroxyapatite. 90.71% is the highest removal rate of crystal violet.

3. Result and Discussion

For this paper, a detailed view of tests like the Contact time, Particle size, Adsorbent dosage, pH is given in a graphical manner. These parameters have a major part in the removal of dye and it also improves the efficiency and yield.

3.1. Effect of Contact Time:

This is primarily used to recognize the adsorption productivity. In this period with the exception of contact time, all the boundaries like temperature, hydrogen particle focus and adsorbent measurements were kept consistent. Figure 1 shows the Contact time on % removal of dyes.

![Contact time on % removal of dyes](image)

The adsorbent measurement of 1gm per 100ml and the temperature of 30℃ are kept up. Expansion in the hour of contact increment the expulsion chose of colour till it arrives at the balance stage. Safranine shows high evacuation while alizarin red s shows lowness in expulsion. After 120mins the evacuation of colour gets balanced out.

Optimum condition of contact time for removal is shown in Table 1.

| Dye              | Safranine dye | Alizarin Red S dye | Indigoid dye | Crystal violet dye |
|------------------|---------------|--------------------|--------------|-------------------|
| Contact time(min) | 90            | 90                 | 90           | 90                |

3.2. Effect Of pH
This is mainly used to find out the hydrogen ion concentration. During this period except $pH$, all the parameters like contact time, temperature and adsorbent dosage were kept constant. Figure 2 shows the Percentage removal on pH

![Percentage removal on pH](image)

**Figure 2.** Percentage removal on pH

The effect of pH is noticed that increase in pH increases in removal. Safranine shows high removal while alizarin red s shows lowness in removal. Optimum condition of pH for removal is shown in Table 2.

**Table 2.** Effect of pH

| Dye          | Safranine | Indigoid | Alizarin Red s | Crystal violet |
|--------------|-----------|----------|----------------|---------------|
| pH           | 4         | 4        | 4              | 4             |

3.3. **Effect of Dosage:**

Optimum condition for removal is shown in Table 3.

**Table 3.** Effect of Adsorbent Dosage

| Dye          | Safranine dye | Indigoid dye | Alizarin Red s dye | Crystal violet dye |
|--------------|---------------|--------------|--------------------|--------------------|
| ACTAC dosage (gm) | 2             | 2            | 1.5                | 2                  |

The dosage of adsorbent was studied with the fixed parameters like contact time of 120 minutes, temperature at 30 degree Celsius and pH 4. Removal Percentage increases with increased of the amount of ACTAC. The highest removal is seen in Safranine dye while the lowest is in Alizarin Red S.
3.4. Effect of Particle Size:

![Particle size (µm) on % of removal of Dyes](image)

Figure 3. Particle size(µm) on % of removal of dyes

The effect of particle size is observed that the removal of dye decreases with the increases in the size of adsorbent as shown in Figure 3. Therefore, the removal of dye increases with decrease in the size of ACTAC. Optimum condition of particle size for removal is shown in Table 4.

| Dye             | Safranine | Indigoid | Alizarin Red S | Crystal violet |
|-----------------|-----------|----------|----------------|---------------|
| Particle Size (µm) | 125       | 125      | 125            | 125           |

Table 4. Effect of particle size

After the study of contact time, Particle size, Amount of Adsorbent and pH, the optimum percentage removal is found. Percentage of dye removal with the obtained optimum conditions is shown in Table 5.

| Dye             | Safranine dye | Indigoid dye | Alizarin Red S dye | Crystal violet dye |
|-----------------|---------------|--------------|--------------------|--------------------|
| Removal Percentage of dye | 80            | 70.95        | 45                 | 74                 |

Table 5. Percentage of optimum conditions

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