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Production and Experimental Efficiency of Activated Carbon using the Fruit Shell of Gulmohar

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I. INTRODUCTION

Water of high quality is essential for human existence and agricultural, industrial, domestic and commercial use and all these activities are also responsible for polluting the water. Majority of the industries are water based and a considerable volume of wastewater originated from these is generally discharged into water sources either untreated or inadequately treated resulting in water pollution. A study conducted by the Centre for Science and Environment, New Delhi, India, has suggested that over 70% of available water in India is polluted (C.S.E. Survey, 1982). The contamination of water due to toxic heavy metals through the discharge of industrial wastewater is a global environmental problem.

The heavy metals reach the water bodies through many industrial activities. From the heavy metals chromium is such metal which is to be found in aqueous system as both ionic forms i.e. Trivalent and Hexavalent chromium.

Recently much importance has been given on removal techniques and developments of new process for heavy removal from waste water. There are large number of industries which discharge chromium containing waste, namely tanning, electroplating, textile cement and asbestos, refractories, cooling towers of thermal power stations and many other industries.

Adsorption has been advocated as most promising among the currently known methods for waste water treatment, especially for removal of heavy metals. The adsorption process can be carried out using abundantly available low cost adsorbent.

In the present study Delonix regia pods (Gulmohar) are selected for preparation of activated carbon for removal of Cr (VI) from waste water.

II. GUIDELINES

The Seeds of Gulmohar (Royal Poincianos), broken into pieces, and churned into powder form, washed in distilled water for 2 to 3 time. The powder was then oven dried at $105 \pm 5^\circ\text{C}$ for 24 hours. The oven dried powder was filled in a small container in three layers, by compacting each layer without any air space to avoid the loss in weight of the powder otherwise it would result in burning of the material directly, leaving behind only the ash. The small container was then placed into a bigger container, such that, sand surrounded the small container completely. The lid of the bigger container was tightly fitted. Then the set-up was kept in muffle furnace at the temperature of 650°C . After attaining the required temperature, the furnace was allowed to cool for about 10 hours. Before the container was taken out. The sketch furnished in figure 3.1 below was the set up of the containers.

The activated carbon thus obtained was sieved to 300μ (sieve) size and packed in a polythene cover and stored in dessicator.

III. TABLE

Plant type		Medium- sized , evergreen , perennial and deciduous trees (fig no.3.2.7.1) Height – 35-40 ft
Growing requirements		Soil tolerance: - clay; loam; sandy; slightly alkaline; acidic; well – drained.
(a)	Leaf	have a feathery appearance and are a characteristic light, bright green and are doubly pinnate each leaf is 30–50 cm long
(b)	Flower	scarlet or orange-red petals up to 8 cm long
(c)	Pods	They can be up to 60 cm long and 5 cm wide
(d)	Seed	are small, weighing around 0.4 g on average

Table :- Botanical Description of Gulmohar (Delonix Regia)

IV. FIGURES OF GULMOHAR (DELONIX REGIA)



Fig.:- Gulmohar (Delonix regia) flower



Fig.:- Pods

REFERENCES

- [1] P. Venkateswarlu, M. Venkata Ratnam, D. Subba Rao and M. Venkateswara Rao "Removal of chromium from an aqueous solution using Azadirachta indica (neem) leaf powder as an adsorbent" International Journal of Physical Sciences.
- [2] Awoyale, A.A., Eloka-Eboka, A.C. and Odubiyi, O.A "production and experimental efficiency of activated carbon from local waste bamboo for waste water treatment" international journal of engineering and applied sciences"
- [3] shashikant.r.mise, sugunashree.s.m "removal of chromium (vi) by activated carbon derived from mangifera indica" international journal of research in engineering and technology
- [4] Khairiraihanna Johari , Norasikin Saman , Shiow Tien Song , Cheu Siew Chin ,Helen Kong , Hanapi Ma "Adsorption enhancement of elemental mercury by various surface Modified coconut Husk as eco-friendly low cost adsorbents.
- [5] Adhena Ayaliw Werkneh, Nigus Gabbiye Habtu, Hayelom Dargo Beyene "Removal of hexavalent chromium from tannery wastewater using activated carbon primed from sugarcane bagasse: Adsorption/desorption studies" American Journal of Applied Chemistry
- [6] Dr. U. SENTHILNATHAN "adsorption kinetics on removal of chromium from wastewater using acacia nilotica wood based activated carbon" International Journal of Advanced Research
- [7] François Eba, Raphinos Kouya Biboutou, Joseph Ndong Nlo, Yvon G. Bibalou and Michel Oyo "Lead removal in aqueous solution by activated carbons prepared from Cola edulis shell (Alocacée), Pentaclethra macrophylla husk (Mimosaceae) and Aucoumea klaineana sawdust (Burseraceae)" African Journal of Environmental Science and Technology
- [8] Renuga Devi N, Manjusha.K and Lalitha P "Removal of Hexavalent Chromium from aqueous solution using an eco-friendly activated carbon adsorbent" Pelagia Research Library
- [9] Murat TEKER, Mustafa _IMAMO_GLUSakarya University, Department of Chemistry 54100 Serdivan, Sakarya-TURKEY., Adsorption of Copper and Cadmium Ions by Activated Carbon from Rice Hulls
- [10] M. Machala Raoa, A. Rameshb, G. Purna Chandra Raoa, K. Seshiah, Removal of copper and cadmium from the aqueous solutions by activated, Carbon derived from Ceibapentandrahulls., Department of Chemistry, Sri Venkateswara University, India; Department of Chemical Engineering, National University, Taipei, Taiwan
- [11] Gupta. D.C. and Tiwari U. V., Aluminium Oxide as Adsorbent for Removal of Hexavalent Chromium from Aqueous Waste. Indian J. Health Dept. Vol.12.no. 2(2013).
- [12] Venkobachar C., Waste products of food industry for metal pollution abatement, AFST 135 (2009).
- [13] Hang C.P., Cr removal by carbon adsorption, Department of chemical engg. USA Institute of technology JW.PC.F., Vol. 12, No.2, 2437 (2009)
- [14] Dived N.N., Removal of Cr (VI) from water using unconventional materials, J. Water Works Association. Department of Chemistry, Dr. Ambedkar Institute of Technology, Bangalore, India. (2012).



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