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ADSORPTION OF FOOD DYES

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Statement of the Problem: Food dye is a member of food additive used for the purpose of changing the color of food so as to attract the consumers. Food dyes are widely used as colorants in food, drug and cosmetic industries, to produce many types of foods including drinks, juices, sweets, cosmetics and drugs. Types of food dyes can be classified as: natural colors, synthetic colors, and lakes and dyes. Dyes that contain an azo-structure can be reduced to aromatic amines by the intestinal microflora are reported to be carcinogenic. Such kind of dyes has also been reported to cause hyperactivity and urticaria in children, asthma, purpura and eczema. The additives used to change the color are required to be pre-approved by various organizations around the world and listed in the regulations as color additives before they can be used in food, drugs, cosmetics, and medical devices. Most countries have their own regulations and list of food colors that can be used in various applications. Natural dyes are unstable and easily undergo degradation during the food processing. The disposal of effluents containing dyes to the environment leads to the coloration, limitation of the reoxygenation capacity of water, decrease in photosynthetic activities in the aquatic system as a result of sunlight penetration decrease, chronic and acute toxicities. The purpose of this study is to describe the studies reported in the literature on the adsorptive removal of food dyes from aqueous solutions.

Methodology & Theoretical Orientation: Numerous conventional treatment techniques including precipitation, coagulation, oxidation membrane filtration, photodegradation and adsorption have been utilized for the removal of dyes from wastewaters. Particularly, adsorption process is considered to be an effective and economical procedure to remove dyes from industrial effluents. It can be applied in removing dyestuffs from industrial wastewaters.

Findings: The development of adsorbents from various sources, their comparison in terms of operating conditions and their adsorption capacities are reported. In the presentation, adsorption of food dyes from aqueous solutions, specific adsorbents developed, optimum conditions, adsorption capacities, isotherms, kinetics, thermodynamic analysis of adsorption are reviewed.

Conclusion & Significance: Medium pH, adsorbent dose, dye concentration, temperature are the important factors that influence the adsorption of dyes.

Biography

Turkan Kopac received her B.Sc and M.Sc degrees in Chemical Engineering from the Middle East Technical University, and Ph.D. in Chemical Engineering from Gazi University, Ankara, Turkey. She has her expertise in adsorption, adsorbent development/characterization, nanostructures, protein adsorption/surface interactions with nanomaterials, dye adsorption, activated carbon from coal, environmental applications, MOF structures, hydrogen storage, metan, carbondioxide absorption.

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