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RESEARCH ARTICLE

Studies on degradation of azo dyes with methyl orange as model dye using *Saccharomycers cerevisiae*

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SUMMARY : Baker's yeast as a low price, very high reserve biocatalyst, has been successfully used for the first time to realize total degradation and decolourisation of methyl orange within 24 hours through biological degradation. The degradation performance of yeast for methyl orange under the effect of various factors has been studied. The non-toxic end product characterization has been done with the help of LC-MS, NMR and FT-IR techniques. The outcome of this research shows that baker's yeast S*accharomyces cerevisiae* has satisfactory catalytic effort in degradation of organic compound and the degraded end product is also less toxic to the environment.

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Degradation, Azo dye, Methylorange, *Saccharomycers cerevisiae*

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Now-a-days water has been polluted in many ways and one such way is due to the release of unwanted substances to the environment by man in quantities that damage either the health or the resources itself. Rapid growth of industries has increased the water pollution to larger extent. This increase in water pollution has greater impact on environment as it results in the formation of waste waters, gaseous emissions, and solid and semi-solid residues leading to air, ground water, and land pollution followed by degradation. Industries mainly like dye manufacturing, dyeing and textile industries causes a greater deal of environment pollution. There are about 10,000 kinds of dyes used in leather manufacturing and textile industries. Synthetic dyes are extensively used in leather, textiles, paper and printing industries that can be classified as azo, anthaquinone, vat, phthalocyanine, indigo, polymethine, caronium and nitro dyes.

Dyes:

Dyes are used to impart colour to materials of which it becomes an integral part. Azoic dyes contain the azo group (and formic acid, caustic soda metallic compounds, and sodium nitrate); especially for application of cotton. While textile mills predominantly use them, azo dyes can also be found in the food, pharmaceutical, paper and printing, leather, and cosmetics industries.

Dye removal techniques:

There are many methods available for the treatment of azo dyes and of dye containing wastewater. Various physical, chemical and biological pre and post treatments can be employed to remove colour from dye containing wastewater. Physical treatment includes membrane filtration, coagulation, flocculation, precipitation, flotation, adsorption, ion exchange, ultra sonic mineralisation and electrochemical treatments. Chemical technology includes oxidation (chlorination, bleaching, ozonation) advanced oxidation (Fenton's, photo oxidation) and reduction. Biological techniques include bacterial, fungal and algal biosorption and biodegradation in aerobic, anaerobic, anoxic or combined anaerobic/ aerobic treatment processes.