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Research Paper Chemistry

Oxidative Degradation of Triazine Derivatives in Aqueous Medium: A Radiation and Photochemical Study

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Triazine derivatives are found to occur as major pollutant in both ground and surface water due to their increased and continual use as herbicides Triazine derivatives arc reported to have many applications and arc effectively used as Herbicides for the prevention of growth of reeds in railway tracks in western countries

It is reported that about 22% of herbicides are used in non-agricultural areas such as forest, lawns, and gardens ete- Tile main mode of action of triazines is by disrupting the light reaction of' photosynthesis.

4.1. Pulse Radiolysis Studies

Determination of rate constants

The bimolecular rate constants for the reaction of OH with triazines was determined by competition kinetic method using thiocyanate (KSCN) KSCN is a well known OH scavenger with a high second order rate constant ($K = 1.1 + 10^{10} M^{-1} S^{-1}$). [144]

4.2. Degradation of triazine derivatives using steady state radiolysis and photochemical method

The radiolysis degradation patterns of TMT in N_2O saturated and in aerated conditions in the absence of N_2O are it can be a complete degradation of TMT is obtained after about 5 k G y in N_2O saturated solutions. However, in aerated solutions, the complete degradation was observed only at 16 k Gy. A G (-TMT) value of 0.26 11 moll was calculated from the initial decrease in concentration of M'S in N_2O saturated solutions whereas only about 0.15.

Son chemistry has emerged as an advanced oxidation process for the destruction of hazardous organic compounds in aqueous solutions. The chemical effects of ultrasound are due to the phenomenon of acoustic cavitations which involve the cyclic growth and collapse of micro bubbles with the concomitant release of heat and production of chemically active species during the last phase of the bubble collapse. The chemical effects are a direct result of the very high temperatures, of the order S 4000-5000 K, and pressures in the range of hundreds of bars that are reached in tile gaseous cavities when the size of the cavities is reduced many orders of magnitude within an ice lnicroscconds.[107, 192,193] Under such extreme conditions, the water molecules present inside the bubble dissociate resulting in the for formation of H and OH as shown (see section 1.1.9).

H_2O (g) -))) $\rightarrow$ OH (g) + H (g)

Textual dyes and other colorants are probably the largest group of industrial chemicals' produced. Among these dyes, azo derivatives constitute a major part of all chemical dyes employed in a wide range of processes in the textile, paper, food, cosmetic sties and pharmaceutical industries. It is reported that about 50% of the dyes used in the industry are azo dyes.

They are characterized by the presence of the azo group (-N=N-) attached to two substituent's, mainly benzene or naphthalene derivatives, containing electron withdrawing and/or donating groups.

The major sources of dyes in tile environment arc effluents from the textile industry it is reported that during the deingprocilsj about 10-15% of tile dye is released as Effluents.

REFERENCES

1 Venkatadri, R. and Peters, R.W. Hz. Wesel & F h Miler 1993, 10, 107 | 2. Hang, C.P., Dong, C. and Tang, Z. Yusuf. Magma. 1993, 13, 361 | 3. Ligroin, O., Olivarez's. and Braun, A.M. Chem. Rev. 1993, 93, 671. | 4. Stefan, M.I. and Bolton, J.R. Environ. Sci. Technol. 1998, 32, 1588 | 5. Monza, P.N.F; relock. Sanianidou, Corte, F. Uele. Environ. 7bxicol. 1988,