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## Gamma Radiation Induced Decoloration and Degradation on Aqueous Solutions of Indigo Carmine Dye

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The textile industry has long been one of the largest water users and polluters. Wastewater released by textile industries contains toxic refractory dye stuff at high concentration. Most of the dyes in the textile industry are non-degradable, therefore, effective treatment of dye waste effluent has not been achieved by ordinary processes. Ionizing radiation has been considered a promising process for the treatment of textile dye waste effluents.

In this study, the possibility of using gamma rays to degrade or decolorize a reactive dye in water was investigated. A reactive dye Indigo Carmine in aqueous solutions was irradiated at doses from 0.1 to 5 kGy at 47.62 Gy/min dose rate. The change of absorption spectra, chemical oxygen demand (COD), and the degree of decoloration were examined. The absorption bands at 248, 285 and 606 nm decreased rapidly with increasing irradiation dose. The COD reduction for the dye solutions attended 90% at 5 kGy. Finally, a kinetic study based on spectrophotometric measurements showed that the degradation process is pseudo first order with an apparent constant  $k_{app}$  equal to 2.693 min<sup>-1</sup>.

### Country/Organization invited to participate

Tunisia

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