

Abstract

Sometimes artificial colors can have an adverse effect on health because many of them are absorbed through the skin and mucous cells. In this study, we choose direct yellow 42 dye because this pigment mainly used in the textile industry. The interaction of above dye with DNA was investigated by spectroscopic methods (Fluorescence, UV-Vis, FT-IR and CD) in physiological buffer (pH~7.4) and at three temperatures 298, 308 and 318 K. The results obtained from absorption spectroscopy indicated that direct yellow 42 can bind to DNA at low concentrations. Thermodynamic parameters obtained from fluorescence experiments at different temperatures revealed the hydrogen binding and van der Waals force in the binding process of this dye with DNA. Binding constants (K) and binding site number were calculated and revealed that the quenching mechanism of EtBr-DNA by dye was static quenching mechanism. Alterations of double-stranded DNA structure induced by direct yellow 42 were confirmed by FT-IR and CD measurements. Our results may provide valuable information to understand the mechanistic pathway of biological behavior of dyes.

Keywords: interaction of DNA, Direct Yellow 42 dye, thermodynamic parameters, spectroscopic methods



University of Zabol
Graduate School
Faculty of Science
Department of Chemistry

**The Thesis Submitted for the Degree of Master of Science
(In the field of Organic Chemistry)**

**Study and investigation of the interaction between DNA and
Direct Yellow 42 dye by spectroscopic methods**

Supervisors:

Dr. Mansur ghaffari moghaddam

Dr. Mousa Bohlooli

Advisor:

Dr. khatereh khorsandy

Dr. Somaye Shahraki

By:

Mahin Galavi Sani

January 2016