



Contribution ID: 23

Type: **Poster**

## Effective Removal of Hazardous Dyes from Aqueous Solutions Using Starch Based Hydrogel and Gamma Radiation

*Thursday, 27 August 2015 14:00 (1h 30m)*

Many treatment processes have been applied for the removal of dyes from waste water such as physical, chemical and biological treatments . Hydrogels are suitable for the removal of dyes due to their hydrophilic nature and three-dimensional polymeric network which can imbibe large amounts of water . This study is divided into three points, the first one was preparation of (acrylamide/ starch) hydrogel by gamma radiation for removal of direct congo red (DCR ) and direct blue (DB) dyes. The ionizing radiation technique is seems an excellent method for the preparation of hydrogels, it is clean and more efficient than other techniques. We report the influence of different parameters that affecting the adsorption. It was found that favorable adsorption was occurred at pH 3 for DCR and pH 10 for DB. The adsorption of dyes onto AAm/starch hydrogels is an endothermic process. Experimental data have been modeled by Freundlich isotherm. The second point was removal of the two dyes by degradation under the effect of gamma radiation. The degradation test of dyes was performed in aqueous solution under various radiation doses and pH and G-value was calculated. Destruction of 70% and 75% of the dye colour solutions was succeeded at radiation dose 40 and 30 kGy for DCR and DB, respectively. Comparing the removal percent of DCR and DB dyes by radiation degradation with that done by AAm/starch hydrogel adsorption was investigated. It was found that preferring removal of DCR and DB dyes by gamma radiation degradation. The novelty of the present study lays on the third point, where, adsorption of remaining dyes after their degradation to complete removal of direct red and direct blue dyes.

### Country or International Organization

Egypt

**Primary author:** MAHMOUD, Ghada (National Center for Radiation Research and Technology , Egypt)

**Co-authors:** Ms ALSHAFEL, Esraa (National Center for Radiation Research and Technology , Atomic Energy Authority, P.O. Box 29, Nasr City, Cairo, Egypt.); Dr EL-KELESH, Nabil (National Center for Radiation Research and Technology , Atomic Energy Authority, P.O. Box 29, Nasr City, Cairo, Egypt); Prof. ABDEL-AAL, Samia (National Center for Radiation Research and Technology , Atomic Energy Authority, P.O. Box 29, Nasr City, Cairo, Egypt.)

**Presenter:** MAHMOUD, Ghada (National Center for Radiation Research and Technology , Egypt)

**Session Classification:** Session 11B: Posters: Nuclear Applications