

Removal and recovery of cationic dyes from textile wastewater by capacitive deionisation: synergetic effect mobility – adsorption

Senoussi Hasna I, Bouhidel Kamel - Eddine I.

1 Laboratory of Chemistry & Environmental Chemistry LCCE, Team: Water Chemistry, Environment & Desalination. Faculty of Sciences, University Hadj Lakhdar Batna 05000 , Algeria.

- 1. Introduction:** The CDI may be considered as a breakthrough in the desalination world. Important research efforts and high investments were accorded to CDI and to electrosorption derived processes [1, 2]. By its simplicity, CDI may change the future trends of desalination technologies. Industrial pollution prevention constitutes other potential application area of CDI [3, 4] with unlimited possibilities. This research work presents an original and very important environmental application, rarely investigated by CDI [5, 6], the cationic dyes removal from textile wastewaters. The textile dye conventional treatments (adsorption, bacterial,...) are destructive without water recycling. The modern treatments, AOP and membranes, have serious drawbacks; fouling and cost with membranes and hazardous by products with AOP. The cationic dye conductance and hydrophobicity was the research hypothesis, which predicted synergetic effects electrochemical mobility – adsorption on the CDI activated carbon electrode. Confirmation was obtained here with the astrazon yellow 7GL (AY) dye.
- 2. Experimenta** The removal and recovery of astrazon yellow 7 GL, a cationic dye, from textile wastewater by capacitive deionisation (CDI) was investigated on a lab Scale CDI module. It was a novel and successful application of CDI. Excellent removal (99%) and recovery efficiencies, limpud treated water and parameters optimization (voltage, flow rate, pH...) were the main findings. It could be a serious alternative to the conventional destructive treatments (adsorption, bacterial, AOP...).
- 3. Results and discussion:** The dyes removal efficiency by CDI was three times (Figure 1) higher than the conventional adsorption. The electrochemical desorption and the dyes recovering were almost total (~99%). More various influencing parameters (applied voltage; pH, flow rate,...) had been systematically studied to optimize the CDI process.

4. References

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