COMPARATIVE STUDY OF ELECTROFLOATATION, COAGULATION, AND ELECTROFLOTOCOAGULATION METHODS OF PLASTICIZERS (DMPA) IN THE PRESENCE OF TEXTILE DYES

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Emollients are auxiliaries' textile substances used to confer an overall appearance of the fabric and to facilitate slipping of fibers or yarns. Emollients enable textile to maintain the softness and prevent development of electrostatic charges during wear. It can be used as auxiliaries in correction of the negative influences of crosslinking or other finishing processes.

One of emollients used in the textile industry is 2, 2-bis hydroxymethyl propionic acid (DMPA). In the process textile dyeing, these compounds along with textile dyes remain in the wastewater.

The main purpose of this research work include treatment of textiles wastewaters from such toxic compounds. For this purpose, were used electrofloatation, coagulation and electroflotocoagulation methods, because these compounds are stable to other catalytic oxidation treatment methods. DMPA emollient removal was studied in the presence and absence active orange dye (PA).

By using electrofloatation with insoluble anodes, of a model solution containing PA + DMPA 200 mg / L + 60 mg / L, it was determined that elecrofloatation optimum time (10 min) and percentage of removal reaches 81.21%.

We studied the influence of DMPA concentration upon the degree of purification and have been determined that by a variation of concentration DMPA in the range 20-80 mg / L and PA 100-200 mg / L, the efficiency of electrofloatation do not depend on the concentration of the dye, but more on the concentration of DMPA emollient. Moreover, as the concentration of DMPA increases, the degree of removal is higher.

In the process of coagulation of the above systems with $Al_2(SO_4)_3$, it has been established the optimal coagulant concentration, and the optimum pH is in the range 5.5-6.0. In the case of electroflotocoagulation of a solution with PA + DMPA (200 mg / L + 60 mg / L) the optimum time is the same 10 minutes, and the degree of removal of the pollutants reach 91.15% for 200 mg / L and to 92.19% for 100 mg / L concentration of dye. By using combined methods (adsorption on activated carbon after coagulation), we could have a degree of efficiency of 93.75% and 98.75% after oxidation of solutions.

In sum, it can be concluded that the degree of effectiveness of the treatment methods used are in the following manner electrofloatation-coagulation-electroflotocoagulation. Electroflotocoagulation method, used in this work, could be considered as the most efficient with a degree of purification up to 92.19%, without adsorption on activated carbon.

GONTA, M.; MATVEEVICI, V.; DUCA, GH.; MOCANU, L.; IAMBARTEV, V. International Symposium *The environment and the industry*. Abstracts, Bucharest 29-30 octomber, 2013, 50-51. ISSN 2344-3898.