CONTROL OF THE COMPOSITION OF THE WASTE WATERS AFTER THE ELECTROCHEMICAL DISTRUCTION OF THE NITROAROMATIC AND NITROPHENOTIAZINE DERIVATIVES

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Waste water from industrial sectors, such electrochemical synthesis, requires special control and treatment for the removal of toxic compounds and/ or recycling of valuable materiel [1].

There are two main objectives of this work:

- Quantitative concentration measurements of the nitro-aromatic compounds during and after electrosynthesis of amines, hydroxyleamines and nitrozo derivatives;
- Removal of nitro compounds from the waste water, by electrochemical oxydation.

One important property of the cyclic voltammograms (CV) or of the polarograms of electrochemically active molecules is that the peak current or limiting current is proportional to the solution concentration [2]. The limite of the CV detection of the nitro compounds is relatively high (10^{-3} – 10^{-5} M) due to the presence of a charging current.

In order to destroy the unreduced nitrocompounds the electrochemical oxydation was used by using the electrogenerated Fenton reactif . The destruction of the organic polluants from the waste waters can be achieved either through chemical methods using differents oxiding agents e.g. the ozone which is considered "a clean" reactive, or by unconventional. alternatives with favorable impact, like direct or indirect electrochemical oxydation.

The mixture between oxygenated water and ferous ions , known as Fenton reactiv generates hydroxile radicals OH*, oxydation agent that is very activ:

$$H_2O_2 + Fe^{2+} \longrightarrow Fe^{3+} + OH^- + OH^*$$

Electrochemistry is a excellent opportunity o produce OH*, *in situ* in aqueous medium, at lightly pozitive potentials (E^0 = 0,69 V/ ECS, at pH =2). The reduction of feric ions to ferous ions takes place in the same potential field. Electrogenerated hydroxile radicals oxidate the organic compounds to CO_2 and H_2O. This method has been applied for electrochemical oxydation of some herbicides of the clorophenole classand of some polyclorurate insecticides.

The purpose of this work is to compare the data obtained by destroying the phenols and nitroderivatives by ozone and through an indirect electrochemical way, with electrogenerated activated hydroxile ions.

The oxydation processes in MeOH medium was studied in the clasical three electrodes cell with the computerised electrochemical system BAS 100. The acceptable total oxydation yields (70-82%) were obtained on Pt electrodes in hydroalcoholic medium (0.1 M Bu_4NR_4 and/or H_2SO_4). The concentration of the un - destroyed nitrocompound is monitorised by electrochemical, UV-vis and HPLC techniques.

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