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THE THEORETICAL DESCRIPTION FOR THE ELECTROCHEMICAL DETERMINATION OF ARYLOXYPHENOXYROPIONATE PESTICIDE IN SOY PRODUCTS

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Soybean products are among the most planted in Cerrado biome in Center-West administrative region of Brazil. The soy plantation and the soybean production is one of the most important areas of the agricultural sector of Brazilian economy, reason why the soybean crops are very important for Brazilian federal government and the governments of Brazilian states, including the areas of Cerrado (Goiás, Mato Grosso, Mato Grosso do Sul, Federal District and parts of the states of Bahia, Tocantinhs, Maranhão, Piauí, Minas Gerais, São Paulo and Paraná). Minimal part of Cerrado is localized nwithin the borders of Paraguay (in the zone of Pedro Juan Caballero and Cerro Corá).

In otder to enhance the fertibility of soy crops by protecting them from gramine weeds, concurring with soy for growth resources, the herbicide preparations, including the cyclohexanediones and aryloxyphenoxypropionates, like fluazifop-*p*-butyl and quizalofop-*p*ethyl (Fig.1). Although they are effective for the soybean protection from weed, they may be toxic if enter the soybean products. For this and other reasons, the development of a rapid and efficient method for their quantification is actual, and the electroanalytical process (either cathodically or anodically) may be an excellent solution for this problem.

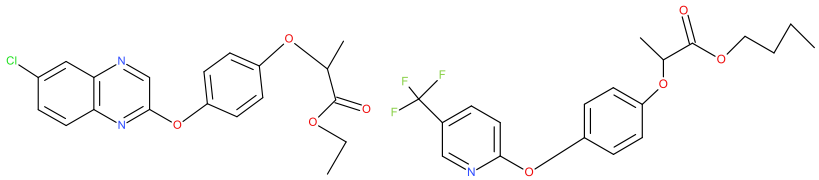

Fig.1. Quizalofop-*p*tehyl and fluazifop-*p*-butyl

In this work the possibility of the quantification of two ryloxyphenoxypropionate herbicides in soy products on anode, modified by cobalt (III) oxyhydroxide, paired with cobalt dioxide. The oxidation mechanism includes both electrocopolymerization, intramolecular heterocyclization and N-oxidation scenarios and is described by the trivariant model (1):

$$\begin{cases} \frac{dq}{dt} = \frac{2}{\delta}\left(\frac{\Delta}{\delta}(q_0 - q) - r_1 - r_{cq} - r_p\right) \\ \frac{df}{dt} = \frac{2}{\delta}\left(\frac{\Phi}{\delta}(f_0 - f) - r_2 - r_{cf} - r_p\right) \\ \frac{dc}{dt} = \frac{1}{C}\left(r_1 + r_{cq} + r_p + r_2 + r_{cf} - r_c\right) \end{cases} \quad (1)$$

Its analysis confirms the efficiency of the model for both quantification and removal (by polymerization and isolation towards the polymer phase) of both of the pesticides from soy products and natural water flow.