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## THE THEORETICAL EVALUATION FOR COLCHICINE ELECTROCHEMICAL DETERMINATION, ASSISTED BY TRIAZOLE-VO(OH) NANOCOMPOSITE

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Safranbolu is one of the oldest historical towns of the North of Turkey [1]. Due to its antique ottoman buildings, it is included into the World Heritage List of UNESCO. The symbol of the city is saffron plant (*Crocus sativus*). This plant has been used in popular medicine and Ayurvedic health system as a sedative, expectorant, anti-asthma, emmenagogue, and adaptogenic agent among others. Its use have been even entioned in Quran and Sunnah.

Many of these effects are explained by the presence of colchicine in saffron composition (Fig. 1). Besides of saffron, it is found also in *Colchicum* specie. It has wide spectrum of medical uses in treatment of different diseases. Nevertheless, despite of its benign action on the organism, side effects like neuropenia, nausea and vomiting. The overdose may provoke more serious effects, like anemia and kidney insufficiency. The hemodialysis is insufficient for complete colchicine elimination from the blood serum. Thus, the development of an exact method for colchicine determination is really actual.

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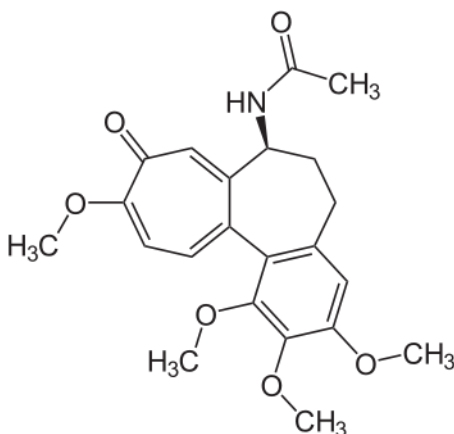


Fig. 1. Colchicine

As colchicine is easy to be reduced in acid media, cathodic determination is preferable. One of the electrode modifiers, capable to be used for this purpose is vanadium(III)oxyhydroxide, a compound with the possibility of semiconducting properties and flexible electrochemical behavior, but more inclined to be reductant. In order to enhance the vanadium (III) oxyhydroxyde stability in acidic medium, the conducting polymers with triazolic moiety, inserted there as a dopant, may be used as stabilizers. Nevertheless, the use of new electroanalytical processes isn't efficient without the detailed theoretical mechanistic investigation of the behavior.

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Thus, the main aim of this work is to evaluate theoretically the possibility of colchicine electrochemical determination, assisted by the VO(OH) – conducting polymer composite. The triazolic derivatives are intercalated into the polymer backbone by means of copolymerization, entrapment or doping. During the cathodic indirect electropolymerization, the first and the last scenarios are preferable.

Two models have been prepared for the composite preparation and for electrochemical analysis of colchicine, and it was shown that both of the processes are efficient, as the steady-state stability is easy to obtain and maintain. The introduction of the triazolic moiety enhances the general polymerization potential. Nevertheless, the partial triazole incorporation in polymer backbone augments its electroanalytical efficiency. The oscillatory behavior is less probable than in the analogous systems being caused uniquely by DEL influences on the electrochemical stages.

### References:

- [1]. H. Alkadi, M. Khubeiz, R.Jbeily, *Infect. Disord. Drug. Targets*, 18(2018), 105