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14115 | Potentiometric determination of histamine in biological samples: forense application

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Post-mortem interval is the time between death event and the moment that the body is found. Many factors and signs can be analyzed to estimate the post-mortem interval such as liver temperature, cadaverous fauna and analysis of signs of death, including cadaveric livors, mydriasis and corpse stiffness. This dating is not always easy to perform because it is too dependent on several factors.

One of the main challenges of the legal medicine is to have an easy, low cost and accurate method to evaluate the post-mortem interval, to be performed by unskilled professionals. Considering the accelerated production of biogenic amines in the body after death, the aim of this work is developed a potentiometric sensor to measure histamine levels and apply it in biological matrices. It is our goal to create a database of histamine levels in different death conditions to be used by the forensic pathologists.

In the present work a histamine sensor is evaluated by using an ionophore cucurbit[6]uril (CB6) and  $\alpha$ -cyclodextrin. Different solvent mediators were considered in the presence or in the absence of anionic additive. The polymeric membrane was also assessed by using polyvinyl chloride (PVC) or carboxylate PVC. The effect of multiwall carbon nanotube (MWCNT) were also considered in different percentages.

The optimal formulation for the membrane comprise 1.0% of CB6, 66.8% (w/w) of 2-nitrophenyl phenyl ether as plasticizer, 29.8% (w/w) of PVC, 0.3% of additive and 2.0% of MWCNT. The sensors were soaked in water before it uses. The histamine sensor performance is characterized by the slope of  $30.9 \pm 1.2$  mV dec<sup>-1</sup>, a detection limit of  $(3.01 \pm 0.61) \times 10^{-7}$  mol L<sup>-1</sup> and the lower limit of linear range of  $(2.99 \pm 0.00) \times 10^{-7}$  mol L<sup>-1</sup>. It was also observed a potentiometric response to cadaverine and putrescine. For that, this sensor will be coupled to a chromatographic system to improve the separation and it our goal to develop a multiparametric method that enables more accurate results.