APPROACHING MOLECULARLY IMPRINTED POLYPYRROLE-BASED SENSOR

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The development of artificial biorecognition systems based on synthetic receptors and molecularly imprinted polymers (MIPs) has attracted great interest [1]. Artificially produced MIPs are used for determining both low and high-molecular-weight analytes [2,3]. It has been shown that the molecular imprinting of polymers can occur even with high molecular mass biomolecules, such as proteins [3].

Polypyrrole (Ppy) is one of the conducting polymers used to create various kinds of sensors [4,5]. In our case, Ppy was used to create coatings on the indium tin oxide (ITO) electrode.

According to the results of various research, phenothiazine derivatives, for instance, methylene blue (MB), combined with polymers such as Ppy can aid in the creation of coatings that have better properties, respond more quickly, and are more responsive to changes in the environment [4,6]. Identification and detection of MB is crucial because it can result in diseases and unfavourable outcomes. To study the characteristics of MB as a polymerized layer, numerous investigations have been carried out. The goal of the recent study was to explore the applicability of the Ppy layer in the phenothiazine derivative MB sensor design as an MIP with MB as a template molecule.

Different deposition conditions, the layer's durability, and thickness impact were analysed. The working electrodes were coated with molecularly imprinted and non-imprinted polymer layers. Potential pulse chronoamperometry and cyclic voltammetry were used to evaluate these layers. This research has demonstrated that the MIP with MB imprints can be used to produce imprinted Ppy-based sensors sensitive to MB.