

## Rapid Detection of Melamine in Milk Products Based on Modified Gold Electrode

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**Abstract :** A novel and simple electrochemical sensor for the determination of melamine was developed based on modified gold electrode (AuE) with chitosan (CHIT) nanocomposite membrane, zinc oxide nanoparticles (ZnONPs) and ionic liquids ([EMIM][Otf]) to enhance the potential current response of melamine. Cyclic voltammetry and differential pulse voltammetry were used to investigate the electrochemical behaviour between melamine and modified AuE in the presence of methylene blue as a redox indicator. The experimental results indicated that the interaction of melamine with CHIT/ZnONPs/([EMIM][Otf])/AuE were based on the strong interaction of hydrogen bonds. The morphological characterization of modified AuE was observed under scanning electron microscope. Under optimal conditions, the current signal was directly proportional to the melamine concentration ranging from  $9.6 \times 10^{-5}$  to  $9.6 \times 10^{-11}$  M, with a correlation coefficient of 0.9656. The detection limit was  $9.6 \times 10^{-12}$  M. Finally, the proposed method was successfully applied and displayed an excellent sensitivity in the determination of melamine in milk samples.

**Keywords :** melamine, gold electrode, zinc oxide nanoparticles, cyclic voltammetries, differential pulse voltammetries

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