

Title : Evaluation of the Sensitivity of the Prussian Blue Test for Preliminary Cyanide Analysis in Specimens

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ABSTRACT

Cyanide is a highly toxic chemical that poses serious health risks to humans by inhibiting cytochrome c oxidase, an essential enzyme in cellular respiration. This inhibition prevents cells from utilizing oxygen to generate energy, leading to histotoxic hypoxia, which can result in fatality within a short period. Therefore, the detection and analysis of cyanide are crucial, particularly in preliminary screening processes that require rapid and convenient methods. One of the commonly used approaches is the Prussian Blue Test, which detects cyanide ions through a chemical reaction with ferric and ferrocyanide ions, forming an insoluble Prussian Blue complex that exhibits a distinct blue color. This study aims to evaluate the sensitivity of the Prussian Blue Test for cyanide detection by comparing its sensitivity in different matrices, including distilled water, gastric contents, and centrifuged gastric contents. Potassium cyanide was used as the standard cyanide. The results indicated that the lowest concentration of cyanide that could be visually detected in all tested matrices was 150 µg/mL. This finding suggests that the Prussian Blue test is a simple, rapid, and cost-effective method for preliminary cyanide screening. However, further studies on several factors that influence the test's performance, such as sample composition and reaction conditions, could enhance its accuracy and reliability for forensic and analytical applications.

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