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Identification of Unlisted Aromatic Compounds from Cold Rubs

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Abstract: This paper explores the identification of unlisted aromatic compounds in cold rub formulations through simple, cost-effective qualitative chemical tests. Acetone is employed as a solvent for sample preparation, and methods such as the iodine, sulfuric acid, and potassium permanganate tests are used to detect aromatic compounds. The study's findings validate the hypothesis that these compounds can be identified using chemical testing, laying the foundation for future research and regulatory practices to ensure consumer safety.

Keywords: *Inhalants, Cold Rubs.*

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I. INTRODUCTION

Cold rubs are topical products used for symptomatic relief in conditions like colds and flu. While they are commonly considered safe, the potential presence of unlisted aromatic compounds poses serious health risks. This study aims to detect such toxic compounds using simple and cost-effective qualitative methods.

➢ *Objective*

- To detect aromatic compounds in cold rubs using qualitative tests.
- To provide a practical and cost-effective approach for the identification of unlisted toxic components.

➢ *Hypothesis*

Aromatic compounds can be identified using chemical testing methods from cold rubs.

II. MATERIALS AND METHOD

10 commercially available cold rub samples were analysed to detect unlisted aromatic compounds. Each sample was dissolved in 5 mL of acetone, which served as an effective solvent to prepare the formulations for testing. Three qualitative chemical tests were employed for the study: the iodine test, the sulfuric acid test, and the potassium permanganate test. Observations, including colour changes and reactions, were carefully recorded to ensure accurate analysis.

III. RESULT ANALYSIS

10 cold rub samples were analysed using 3 different tests, in which 8 of them provided positive results for all tests while 2 of them showed different outcome in one of the three tests conducted.

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Fig 1 Positive Result On Iodine Test

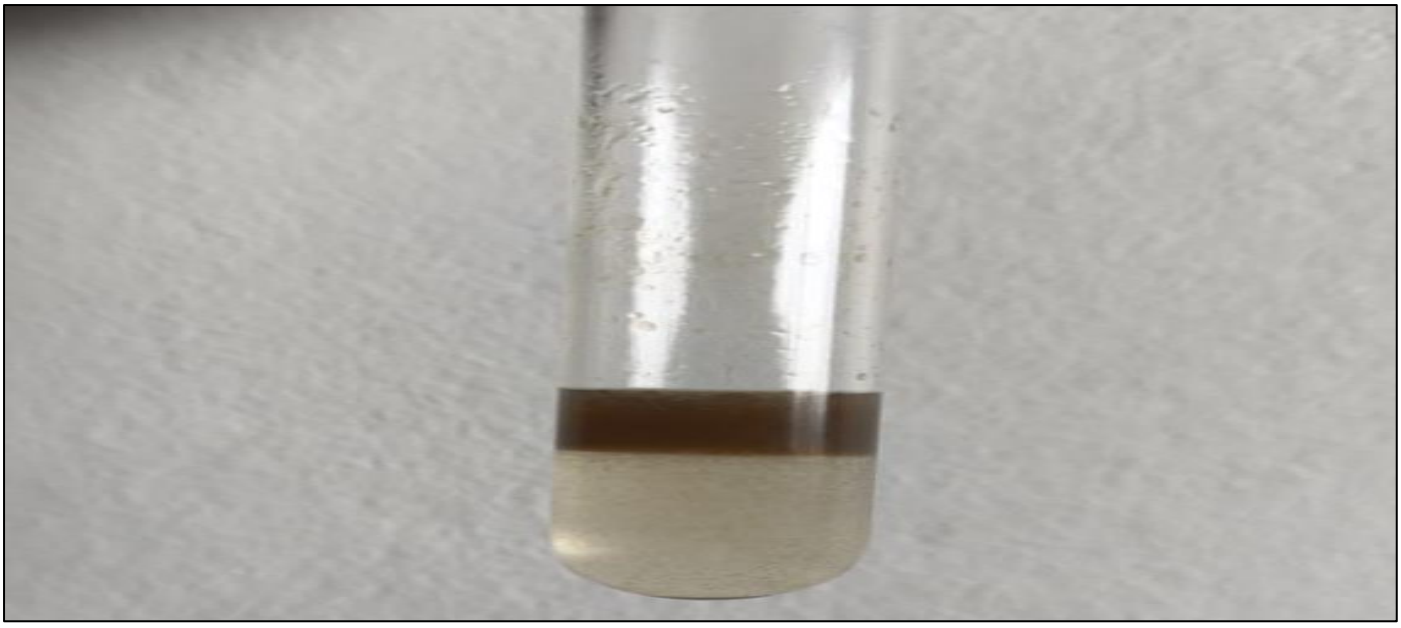

Fig 2: Positive Result On Potassium Permanganate Test

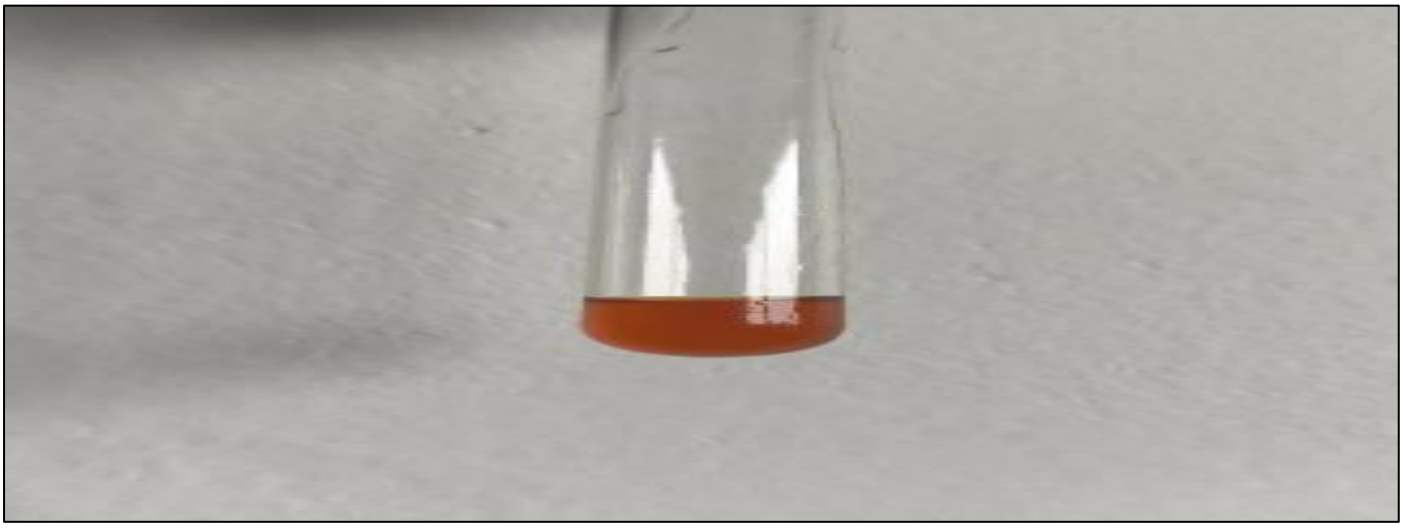

Fig 3: Positive Result On Sulphuric Acid Test

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The study utilized three qualitative chemical tests—iodine, sulfuric acid, and potassium permanganate tests—to analyse ten cold rub samples for unlisted aromatic compounds. The iodine and sulfuric acid tests consistently confirmed the presence of aromatic compounds across all samples. The potassium permanganate test was successful in identifying aromatic compounds in most samples but yielded negative results in 2 Samples, likely due to differences in chemical composition or lower concentrations of aromatic compounds in those specific formulations. These observations strongly validate the hypothesis that aromatic compounds can be detected in cold rub formulations through chemical testing methods, demonstrating the practicality and reliability of these tests for identifying unlisted toxic components.

IV. CONCLUSION

This study explored the detection of unlisted aromatic compounds in cold rub formulations using qualitative chemical tests, including iodine, sulfuric acid, and potassium permanganate tests. Through systematic analysis of ten cold rub samples, aromatic compounds were reliably detected in most cases. The iodine and sulfuric acid tests demonstrated consistent reliability, while occasional negative results from the potassium permanganate test, particularly for Samples 2 and 3, were attributed to differences in chemical composition or potential interferences from non-aromatic components. The study emphasizes the practical, cost-effective nature of these methods for preliminary identification of toxic substances, while validating the hypothesis that aromatic compounds in cold rub formulations can be effectively identified through these chemical tests. The findings reinforce the importance of accessible testing methods for consumer product safety and provide a foundation for further advancements in forensic toxicology and regulatory practices. Identified limitations, such as the qualitative nature of the methods, restricted sample size, and variability in formulations, underscore the need for future research employing advanced analytical techniques like GC-MS or LC-MS to achieve quantitative and comprehensive profiling of aromatic compounds. Additionally, expanding the sample pool and assessing the health impacts of these unlisted components are critical for improved safety evaluations. By laying a foundation for routine quality control and regulatory oversight, this study highlights the need for transparency in product labelling and the standardization of testing protocols, contributing to enhanced public health protection and safer pharmaceutical formulations.

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