

TABLE 2 — DETERMINATION OF ARSENIC IN TOBACCO

Sample No.	Amount of tobacco taken (g)	Amount of arsenic taken (μg)	Amount of arsenic found (μg)	Error (%)
—	—	10	10.3	+3.0
—	—	15	15.4	+2.7
—	—	20	20.7	+3.5
—	—	50	49.1	-1.8
A	5	—	4.5	—
B	7	—	6.3	—
C	9	—	3.5	—
D	6	—	5.8	—
E	10	—	4.7	—

tobacco sample (1 g) and Na_2O_2 (1.5 g) were added on to the solidified mass. It was heated gently for 10 min while adding Na_2O_2 (2×1 g) intermittently until there was a complete decomposition of the organic matter.

The above procedure was repeated with more of tobacco and Na_2O_2 till 5 g of tobacco sample had been decomposed. The crucible was finally heated for 15 min, cooled and water (15 ml) added. The contents of the crucible were warmed on a steam-bath until the melt was completely disintegrated. The solution was centrifuged and the residue washed with water. The centrifugate and washings were collected in a 100 ml conical flask, acidified with HCl (6M) and boiled gently to decompose peroxide. The solution was cooled and conc. HCl (15 ml) added followed by aq. KI (2 ml, 15%) and SnCl_2 solution (1 ml, 40%) in conc. HCl. The contents were kept for 30 min at room temperature. Zinc metal (3.4 g) was added and the evolved arsine (AsH_3) decomposed to metallic arsenic by heating the tube. Metallic arsenic was dissolved in a minimum amount of hot HNO_3 and the resultant solution neutralized with dil. NaOH. It was reacidified with AcOH (2N) and the final volume made up to 2 ml by evaporation and dilution. An aliquot of the solution was subjected to the ring oven method as described above whereby the arsenic content of tobacco was determined and the results are given in Table 2. The efficacy of the above alkaline peroxide fusion method was checked separately by ring-colorimetric and volumetric (potassium bromate)⁸ methods. In both the methods known amounts of arsenic as arsenic trioxide were taken. A few representative ring colorimetric results have also been incorporated in Table 2.

Uranium forms a red insoluble chelate with the reagent under the specified conditions. The interference of various foreign ions was studied by developing rings for $\text{UO}_2(\text{II})$ ions with and without the foreign ions taken in varying amounts up to 25 μg . The ions which did not interfere in the procedure are: NH_4^+ , Li^+ , Na^+ , K^+ , Rb^+ , Cs^+ , Ag^+ , $\text{Cu}(\text{II})$, $\text{Hg}(\text{II})$, $\text{Cd}(\text{II})$, $\text{Sn}(\text{II})$, $\text{Pb}(\text{II})$, $\text{Bi}(\text{II})$, $\text{Be}(\text{II})$, $\text{Mg}(\text{II})$, $\text{Ca}(\text{II})$, $\text{Ba}(\text{II})$, $\text{Sr}(\text{II})$, $\text{Al}(\text{III})$, $\text{Mn}(\text{II})$, $\text{Cr}(\text{III})$, $\text{As}(\text{III})$, $\text{Sb}(\text{III}, \text{V})$, $\text{Ni}(\text{II})$, $\text{Co}(\text{II})$, $\text{Zn}(\text{II})$, $\text{Ga}(\text{III})$, $\text{In}(\text{III})$, $\text{Tl}(\text{I})$, $\text{Se}(\text{IV}, \text{VI})$, $\text{V}(\text{V})$, $\text{Au}(\text{III})$, $\text{Pt}(\text{IV})$, $\text{Pd}(\text{II})$, $\text{Ru}(\text{III})$, $\text{Rh}(\text{III})$, $\text{Os}(\text{VIII})$, $\text{Ir}(\text{IV})$, $\text{La}(\text{III})$, $\text{Nd}(\text{III})$, $\text{Pr}(\text{III})$, $\text{Gd}(\text{III})$, $\text{Sm}(\text{III})$, $\text{Y}(\text{III})$,

$\text{Hf}(\text{IV})$, $\text{Zr}(\text{IV})$, $\text{Re}(\text{VII})$, $\text{W}(\text{VI})$, NO_2^- , NO_3^- , CO_3^{2-} , Cl^- , Br^- , I^- , SCN^- , SO_4^{2-} , SO_3^{2-} , $\text{S}_2\text{O}_8^{2-}$, $\text{S}_2\text{O}_8^{2-}$, CrO_4^{2-} , $\text{Cr}_2\text{O}_7^{2-}$, ClO_3^- , ClO_4^- , BrO_3^- , IO_3^- , $\text{Fe}(\text{CN})_6^{3-}$ and $\text{Fe}(\text{CN})_6^{4-}$. $\text{Th}(\text{IV})$, $\text{Ce}(\text{III}, \text{IV})$, $\text{V}(\text{IV})$, $\text{Fe}(\text{II}, \text{III})$, S^{2-} and PO_4^{3-} ions, however, interfere.

The serious interference caused by fluoride, oxalate, citrate, tartrate, and EDTA is obviated by boiling the test sample three to four times with HNO_3 to almost dryness followed by evaporation with water. Interference due to fluoride and EDTA has also been overcome by treating the sample solution with a mixture of aluminium and nickel ions in the presence of ammonium acetate and AcOH. During this operation aluminium ions form more stable complex with fluoride ions than uranium ions whereas nickel ions mask EDTA. The high selectivity of the determination of uranyl ions has been achieved by incorporating arsenate ions as the fixing agent for uranyl ions under the specified conditions.

During the determination of arsenic in tobacco, alkaline peroxide method has been preferred over the conventional wet acid digestion process. Since the organic materials (pyridine and other nitrogen ring compounds) present in tobacco are hard to decompose, wet oxidation takes very long time with a large consumption of acids. This difficulty has been obviated in the present alkaline peroxide method for the decomposition of organic matter. The method has been found highly suitable in the case of tobacco.

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5-Hydroxy-1,4-naphthaquinone (Juglone), a New Indicator in Acidimetry & Alkalimetry

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5-Hydroxy-1,4-naphthaquinone has been successfully used in acidimetry and alkalimetry. With juglone the pH range for colour change (yellow \rightarrow violet) is 7.8-9.9, thereby rendering it more suitable for acid-base titrations as compared to phenolphthalein.

NAPHTHAQUINONE and its derivatives have been used in industry¹, medicine² and for qualitative and quantitative estimation of metal

