

# ESTIMATION OF SALIVARY THIOCYNATE LEVELS IN SMOKERS

**INTRODUCTION:** Individualisation of smokers from non-smokers is an important criteria for the diagnosis of oral diseases. Thiocyanate levels have been used as smoker's marker and can be extracted from blood serum, plasma, urine, saliva and gingival cervical fluid (GCF).

## OBJECTIVES

1. To review the literature on the use of salivary thiocyanate as a marker for smoking detection
2. To discuss in detail about its usage as a viable marker.

## METHODOLOGY

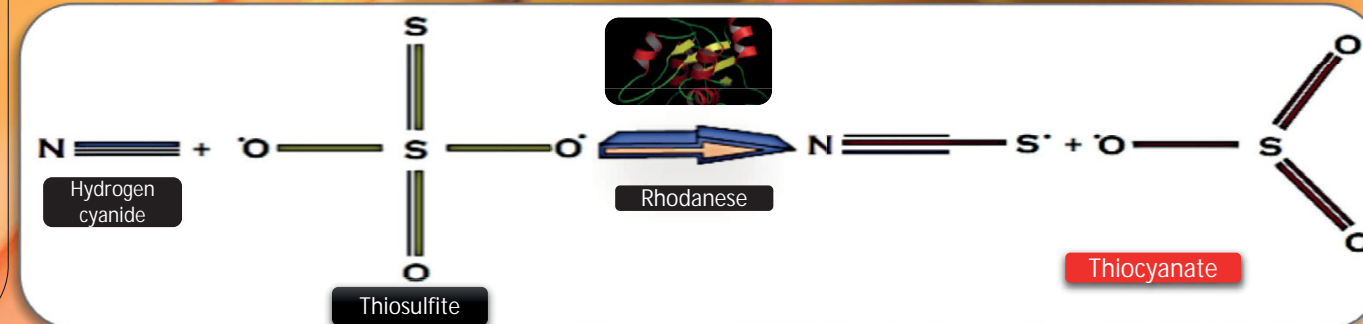
The articles were searched in PubMed, Scopus and Web of Science with key words: salivary thiocyanate + smoker. A total of 49 articles were found and downsized to 18 articles based on the inclusion and exclusion criteria

## INCLUSION CRITERIA

1. Articles where salivary thiocyanate was exclusively used as a marker.
2. Articles where the study was carried out on healthy individuals with no oral and systemic diseases.

## EXCLUSION CRITERIA

1. Studies where other habits such as smokeless tobacco were considered.
2. Repeated/ Overlapping results (articles) from the three search engines.



DENSEN METHOD



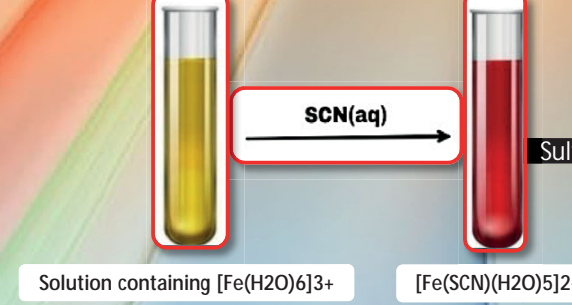
Saliva sample collection



Deproteinization by 20g Trichloro Acetic Acid in 100ml of water



FERRIC NITRATE REAGENT  
80g ferric nitrate+250ml nitric acid+ 500ml of water



THIOCYNATE detected by FERRIC THIOCYNATE (RED COLOUR COMPLEX)



SMOKER'S DETECTION

**RESULTS**  
The results of all the studies showed that there is up to a 50% increase in salivary thiocyanate levels in smokers.

## DISCUSSION

Salivary thiocyanate is a marker similar to serum thiocyanate. This is because there is a significantly higher concentration of thiocyanate in the saliva of smokers, because tobacco smoking has a higher risk for cyanide exposure and thiocyanate is the end metabolite. The studies reviewed indicate that the Densen methodology is relatively simple.

### Following studies used

#### DENSEN METHOD:

- Russel V Leupker et al.
- Zil a Rubab et al.
- Nancy Haley et al.
- Muhammad et al.

### ADVANTAGES

- Long half life
- Non-invasive
- Reliable method

### DISADVANTAGES

- False positive resulting from cyanogenic food
- Social stigma of saliva

### USES

- Ω Chain smokers
- Ω Mass screening
- Ω Detection in adolescents
- Ω Alternative method of estimating thiocyanate in patients with phobia of syringes

## CONCLUSION

Thiocyanate is an end-product of the detoxification of hydrogen cyanide present in cigarette smoke and is translated into an elevated level of thiocyanate in smokers, which can be used as a potential marker.

### BIBLIOGRAPHY:

1. Paul M. Densen , Bernard Davidow , Hyman E. Bass & Ellen W. Jones. A Chemical Test for Smoking Exposure, Arch Environ Health. 14:6, 865-874.
2. I.I. Muhammad, R.S.U. Wasagu, M.K. Abubakar. Salivary Level of Thiocyanate in Smokers and Non-smokers: A Case Study Taken at Usmanu Danfodiyo University, Sokoto Nigeria. Research & Reviews: A Journal of Life Sciences. 2017; 7:1, 1-5.
3. Luepker et al. Saliva Thiocyanate: A Chemical Indicator Of Cigarette Smoking in Adolescents. Am J Public Health. 1981, 71:12, 1320-24.