



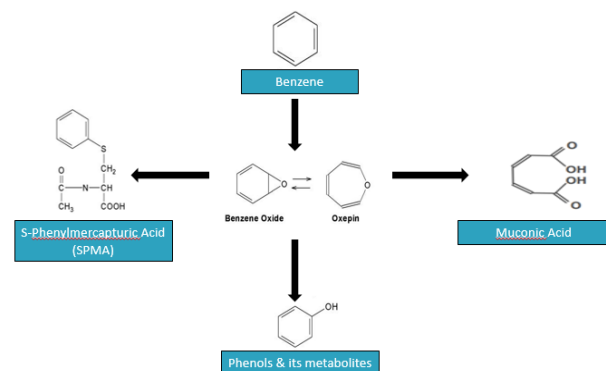
Urinary Biomarkers of Benzene

Introduction

Exposure to benzene is possible during production of benzene via coal tar distillation from petroleum refining, when cleaning tanks in which benzene has been stored, coke and coal chemical manufacturing, rubber tire manufacturing and transportation of benzene. Workers who may be exposed to benzene include steel workers, printers, rubber workers, shoe workers, lab technician, firefighters, and petrol station employees. Benzene is found in crude oil, petrol and cigarette smoke. (*Guidelines on The Diagnosis of Occupational Disease, 2nd Ed 2019*)

Metabolism of Benzene:

Inhaled benzene is rapidly absorbed through the lungs and metabolized mainly in the liver. Most of its metabolites are excreted in urine within 48 hours after exposure.



Regulatory Guidelines

Urinary Biomarker	Limit
S-Phenylmercapturic Acid (SPMA)	25 µg/g creatinine
t,t-Muconic Acid (ttMA)	500 µg/g creatinine
Phenol	>50 mg/L

Regulatory source: *Guidelines on Medical Surveillance, DOSH 2001*

Sample Storage and Preservation



- Sample size required: 20 mL
- Plastic, preservative-free
- Refrigerate (0 – 8°C) or freeze upon collection

Benzene biomarkers is stable in Frozen urine for periods of a month or more.

Sampling Time:

Urinary Biomarker	Sampling time	Reference
SPMA	End of Shift	American Conference Governmental Industrial Hygienist (ACGIH), 2018
ttMA		
Phenol		

ALS Method:

Urinary Biomarker	Limit of Reporting	Instrument
*SPMA	10 µg/g creatinine	Liquid Chromatography-Mass Spectrometry (LC-MS)
*TTMA	300 µg/g creatinine	Liquid Chromatography-Mass Spectrometry (LC-MS)
Phenol	0.05 mg/L	Gas Chromatography-Mass Spectrometry (GC-MS)

***Method is accredited based on ISO17025**

Turnaround Time (TAT): 5 days upon sample receipt at laboratory

Please contact us to discuss your analysis requirement and we will assist you with the proposal:

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