1. Cobalt in Urine

Introduction

Cobalt is a naturally occurring element widely distributed in the environment, it is an essential trace element and is utilised as a component of B12. Cobalt is absorbed by inhalation and ingestion and the amount absorbed depends on the solubility, soluble compounds are easily absorbed and rapidly excreted in the urine. Due to the low level of cobalt in body fluids urine cobalt is used as a measure of occupational exposure.

Occupationally cobalt is used as an alloy in the production of hard metal (tungsten carbide), manufacture of high temperature alloys for jet engines, in magnets and as a catalyst in after burners. It is also used as an alloy in joint prostheses. Workers in the saw-doctor and knife-grinder industries are at risk from inhalation of cobalt from the dust created during grinding processes.

Sample Requirements

20 mL fresh random urine collected into a sterile container. Ensure that hands are washed and clothes are free of contamination

For occupational exposure samples are collected at the end of the shift at the end of the working week as Cobalt is rapidly excreted.

Interpretation

Non exposed levels < 20 nmol/L (1µg/L)

Workplace exposure standards (2002)²

- Biological Exposure Index 255 nmol/L (15 µg/L)
- Biological Exposure Index (BEI) – levels above which excessive exposure has occurred.
Cobalt in urine has a short biological half life and reflects recent exposure therefore samples should be taken at the end of the working shift at the end of the week.

**Toxic effects**

Inhalation of cobalt compounds can cause cobalt sensitisation, occupational asthma and interstitial lung disease associated with high exposure, previously called ‘hard metal’ disease. Cobalt may also cause allergic dermatitis.