

M501: MEASUREMENT OF HAZARDOUS SUBSTANCES INCLUDING RISK ASSESSMENT

ANSWERS TO OVERNIGHT REVISION QUESTIONS – DAY 2

1. Initial appraisal, basic survey, detailed survey, routine survey.
2. An indication as to the variability of data within a particular dataset.
3. Adopt good occupational hygiene practices. Use validated methods, appropriate calibration procedures and field blanks.
4. See section 5.1.3 of the Student Manual.
5. Inter-operator and within process variability.
6. Full shift time weighted average sampling.
7. A combination of full shift, short term and task monitoring would be appropriate.
8. Dichloromethane (methylene chloride) is a colourless volatile liquid which would indicate the need to assess the area with either indicator tubes or portable instrumentation. The results of this exercise would determine the exclusion area and what further monitoring would be required.
9. The normal confined entry procedures should be observed (see section 5.6 of the Student Manual). Testing for the % LEL would be necessary, along with an assessment of any solvent vapour present in the tank. Both long term and short term monitoring would be necessary or if possible alarmed instrumentation. Skin absorption should also be considered.
10. Biological monitoring is a way in which you can determine how much of a particular contaminant has actually entered and has been taken up by the body.
11. Direct biological monitoring involves the direct analysis of the contaminant in the specimen (eg lead in blood) or the analysis of its metabolites (eg carboxyhaemoglobin from carbon monoxide in blood).

Biological effect monitoring is aimed at identifying early and reversible biochemical changes resulting from exposures (eg zinc protoporphyrin in blood).

12. Contamination. Changing clothing and washing hands before providing a sample minimises contamination.
13. Gases and organic vapours.
14. Mandelic acid in urine.
15. The concentrations of some determinants can change rapidly – duration of retention dependent on excretion rate of particular target organ.
16. Metallic elements, eg Fe, Ni, Cr.
17. AAS using hydride generation. Poor sensitivity – spectral lines in far UV.
18. Metals and organics – coloured complexes formed.
19. Absorption or emission of infrared radiation produces a unique spectrum or finger print from the vibration or rotation of a molecule, eg quarts doublet.
20. NIOSH
UK HSE
OSHA
ISO
National Standards