

M504 Asbestos and Other Fibres – Answers to revision questions

Section 8 – Analysis of bulk samples

1. What type of microscopy is usually used to analyse bulk samples for asbestos?
(Page 156 – 157)
 - Low power stereo microscope
 - Polarised light microscopy (PLM)
 - Dispersion staining
2. What are the health and safety issues related to analysis of asbestos bulk samples? What precautions / systems should be in place to minimise these risks?
(Pages 157 – 158)
 - Fibre inhalation – safety cabinet (0.5 m/s face velocity, HEPA filter, regular checks / maintenance)
 - Acids etc – risk assessment, protective clothing, goggles etc
 - Refractive index liquids – gloves
3. Why is sample preparation undertaken? What techniques are available?
(Pages 160 – 161)
 - Release fibres from sample matrix
 - Remove particles / debris from separated fibres
 - Obtain dry fibres
 - Physical extraction, acid digest, solvent extraction, combustion, wet grinding
4. What is meant by the following terms?
 - a. Pleochroism - Under polarised light – colour of fibre changes when rotated
 - b. Birefringence - Anisotropic materials e.g. asbestos fibres and many crystalline materials show brightly at 45 degree angle relative to axis of crossed polarisers
 - c. Extinction - when anisotropic extinguish (or go dark when rotated relative to crossed polarisers (usually at 0 and 90 degrees)
 - d. Sign of elongation - length fast or length slow (crocidolite is only length fast fibre, others length slow (be aware of high temperature changes)
(Pages 168 – 171)
5. How is dispersion staining used to confirm the type of asbestos? What refractive index liquid is used for the three most commonly found asbestos fibre types?
(Pages 171 – 173)
 - Using dispersion staining objective – shows colour effects when fibre placed in liquid of similar refractive index
 - Chrysotile – 1.55
 - Amosite – 1.67
 - Crocidolite – 1.70

6. What procedures / systems should be in place to improve the reliability of results of asbestos bulk analysis? (Page 174)

- Routine quality assurance procedures
- Written protocols / standard methodology
- External proficiency testing schemes
- Restrict daily workload