TAP 530- 3: Simulating X-ray diffraction

Introduction:

Basic X-ray diffraction involves the transmission of X-rays through a thin sample. This can be simulated using a laser through Lycopodium powder/talcum powder or tree pollen sandwiched between two microscope slides

You will need:

- ✓ low-power laser
- ✓ screen
- ✓ pair of microscope slides (2)
- ✓ stand to support slides, e.g. retort stand
- ✓ powder (talc, Lycopodium) or tree pollen

	**Safety** Provided the laser is class 2 (less than 1 mW for visible light), the warning 'Do not stare down the beam' is sufficient. Avoid specular reflections. **Allergic reaction** Class members may be allergic to pollen (e.g. Lycopodium), check before use.

What to do:

Make a film of powder sandwiched between microscope slides. For best results the film should be very thin. Blowing away the excess usually achieves this.

You have seen:

- The pattern produced by Lycopodium powder will be a ring pattern due to the random orientation of the scattering centres which causes the maxima to occur as a cone of a particular angle.
- Talcum powder consists of larger particles so, although the pattern is due to diffraction, the pattern does not show the ring shape but simply a random arrangement of spots.

Practical advice

Do not breath in the dust particularly Lycopodium powder.

External reference

This activity is taken from Salters Horners Advanced Physics, section DUTP, activity 15