

銘傳大學八十七學年度管理科學研究所碩士班招生考試
(甲組) 第一節

普通物理學 試題

註：本試題可使用計算機

1. 140-g baseball, in horizontal flight with a speed v_i of 39 m/s, is struck by a batter. After leaving the bat, the ball travels in the opposite direction with a speed v_f , also 39 m/s. (a) What impulse J acted on the ball while it was in contact with the bat? (b) The impact time Δt for the baseball-bat collision is 1.2 ms, a typical value. What average force acts on the baseball? (c) What was the average acceleration of the baseball? (d) How much work does the bat do on the baseball during the collision?
2. Here are five pure numbers 5, 13, 39, 63, and 96. (a) What is the average value of these numbers? (b) What is the rms value of these numbers? (c) Give two physical or engineering examples in which rms values of variables are used.
3. Devise a method for measuring the magnetic dipole moment μ for a bar magnet.
4. A slit of width a is illuminated by white light. (a) For what value of a will the first minimum for red light ($\lambda = 650\text{nm}$) fall at $\theta = 15^\circ$? (b) What is the wavelength λ' of the light whose first diffraction maximum (not counting the central maximum) falls at 15° , thus coinciding with the first minimum for red light?
5. Fig. 1 shows the Compton's results for four values of the scattering angle ψ . Explain the meanings of this figure by Compton effect.

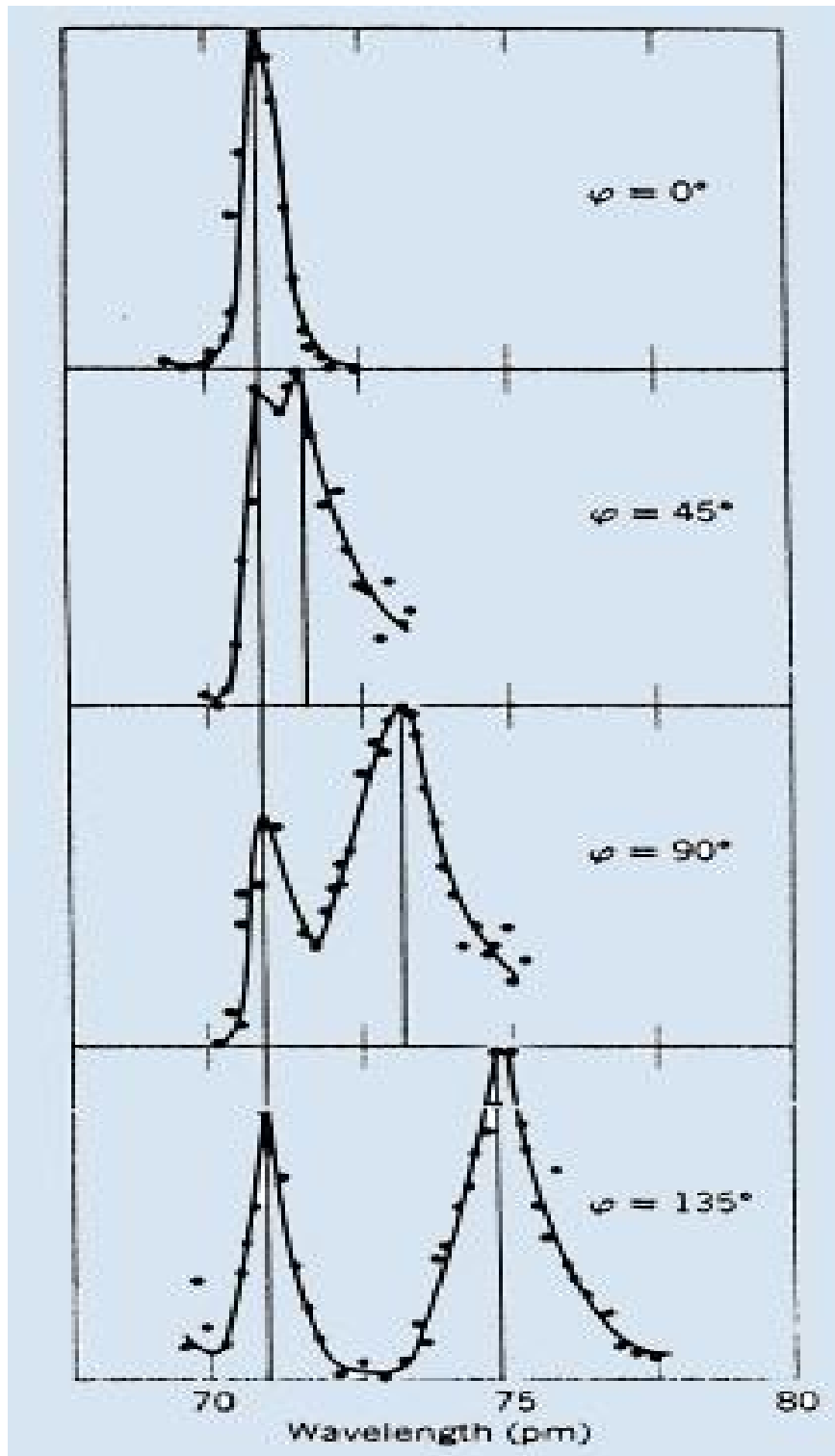


Fig. 1

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