

- 7 (a) Distinguish between the appearance of emission and absorption line spectra.

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[2]

- (b) The lowest six discrete energy levels for a hydrogen atom are shown in Fig. 7.1, where the ground state is -13.6 eV .

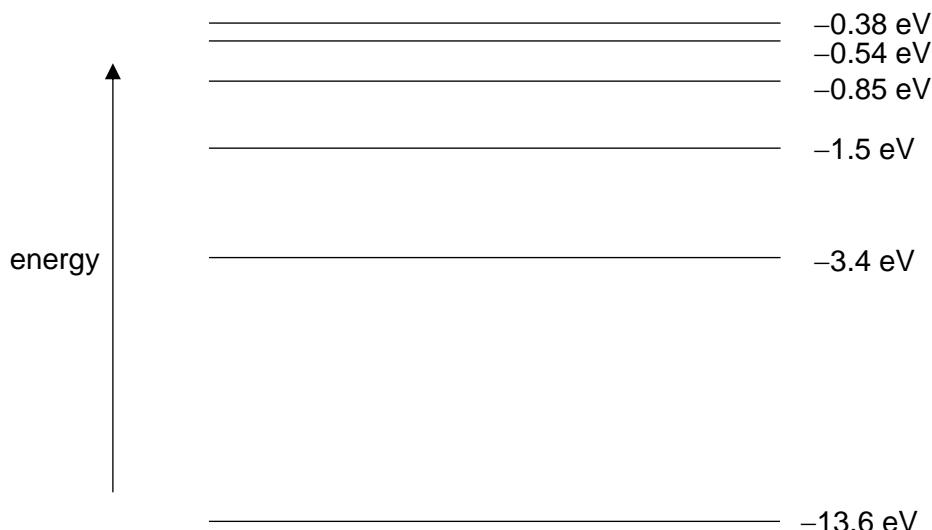


Fig. 7.1 (not to scale)

- (i) The spectrum produced by hydrogen is a line spectrum. Use Fig. 7.1 to explain why the spectrum is a line spectrum rather than a continuous spectrum.

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[2]

- (ii) Describe one way by which an electron in gaseous hydrogen can be raised from a ground state to the -0.54 eV energy level.

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[1]

- (iii) State the total number of different wavelengths that may be emitted as the electron de-excites from the -0.54 eV energy level.

number = [1]

- (iv) Electromagnetic radiation is emitted when an electron falls to the ground state from from the -0.54 eV energy level.

Calculate the wavelength of this radiation. Suggest the type of radiation emitted.

wavelength = m

type of radiation =

[2]

[Total: 8]