

- 8 White light is incident on a cloud of cool hydrogen gas, as illustrated in Fig. 8.1.

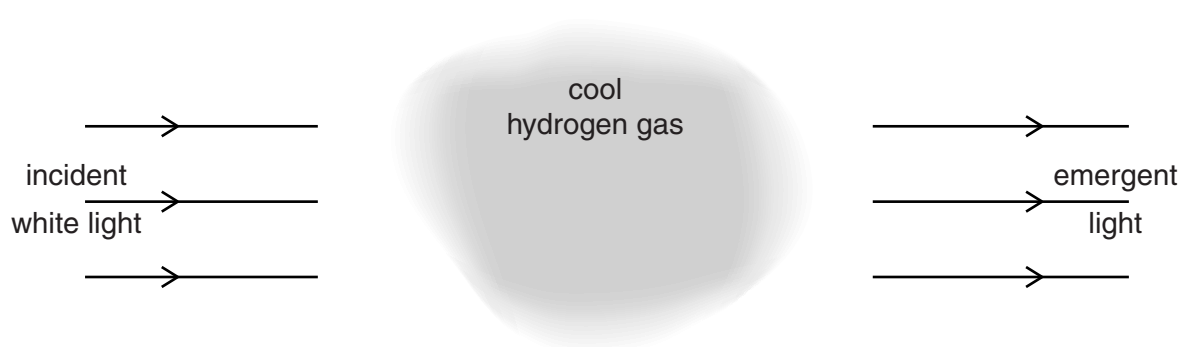


Fig. 8.1

The spectrum of the light emerging from the gas cloud is found to contain a number of dark lines.

- (a) Explain why these dark lines occur.

.....

.....

.....

.....

..... [3]

- (b) Some electron energy levels in a hydrogen atom are illustrated in Fig. 8.2.

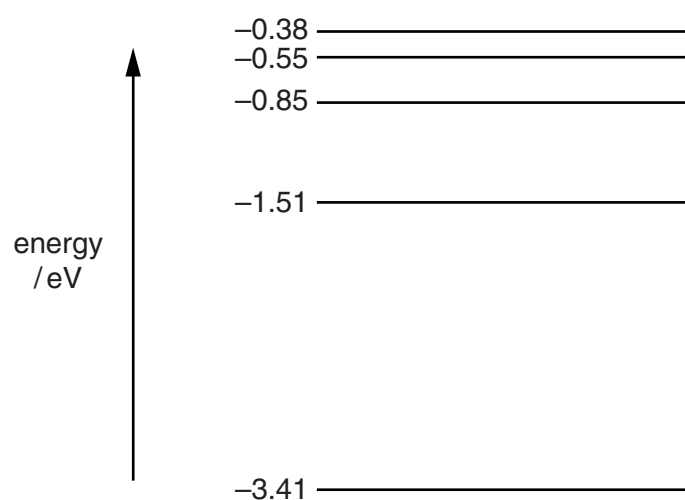


Fig. 8.2

One dark line is observed at a wavelength of 435 nm.

- (i) Calculate the energy, in eV, of a photon of light of wavelength 435 nm.

energy = eV [4]

- (ii) On Fig. 8.2, draw an arrow to indicate the energy change that gives rise to this dark line.
[1]