

- 6** Fig 6.1 shows some of the electron energy levels in an isolated atom of lithium.

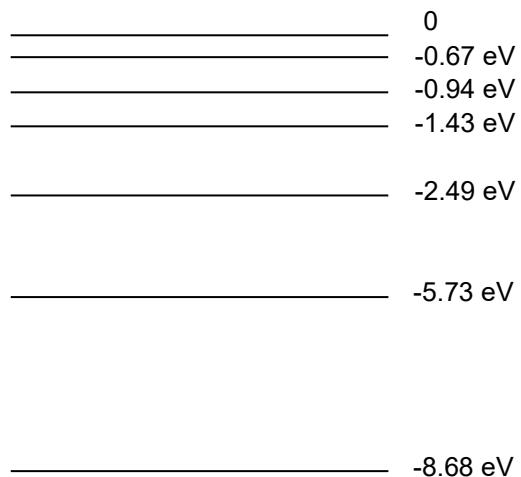


Fig. 6.1

The outer electron of a lithium atom is in the lowest energy level shown.

Electrons of energy 7.50 eV are directed at a discharge tube of lithium gas.

- (a)** Calculate the de Broglie wavelength of the electrons directed at the gas.

$$\text{de Broglie wavelength} = \dots \text{m} \quad [2]$$

- (b)** State the range of energy of the recoiling electrons.

..... eV ≤ energy ≤ eV [1]

- (c) Sketch on Fig. 6.1 the transitions that represent the photons produced from the lithium gas, having electrons of 7.50 eV directed at it. [1]

- (d) Calculate the wavelength of the most energetic photon produced and state the region of electromagnetic spectrum to which it belongs.

wavelength = m

region = [3]

- (e) The ionization energy of lithium atom is 8.68 eV. Suggest and explain whether the work function of lithium metal is larger or smaller than 8.68 eV.

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.....
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[2]

