

Marks
3

- Gamma emission involves the radiation of high energy γ photons and accompanies most types of radioactive decay processes. γ photons typically have wavelengths less than 0.1 Å. Calculate the energy of a photon with wavelength $\lambda = 0.1$ Å. Give your answer in J per photon and kJ mol^{-1} .

| | |
|--------------|----------------------|
| $E =$ | $E =$ |
| J per photon | kJ mol^{-1} |

Why is high energy or gamma radiation called ionising radiation?

- What are two of the key results arising from a wavelike description of matter?

- Each of the following electron configurations represents an atom in an excited state. Identify the element and write its ground state electron configuration.

| Electron configuration of excited state | Element | Electron configuration of ground state |
|---|---------|--|
| $1s^2 2s^2 2p^6 3s^2 3p^4 4s^1$ | | |
| $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3 4p^1$ | | |