**Chapter 16: Atoms and Radioactivity**

**1**  The standard notation for a chemical element is:

$$\begin{matrix}A\\Z\end{matrix}X$$

**a** Explain what the letters A, Z and X stand for.

 A:

Z:

X:

 **b** You have an atom of each of the following elements. Identify the number of protons, neutrons and electrons in each atom.

$\begin{matrix}14\\7 \end{matrix}N$

protons: neutrons: electrons:

$$\begin{matrix}28\\14\end{matrix}Si$$

protons: neutrons: electrons:

$\begin{matrix}238\\92\end{matrix}U$

protons: neutrons: electrons:

**2** **a**  Define the term isotope.

 **b** Carbon can exist in several forms. The most common form is$ \begin{matrix}12\\6\end{matrix}C$. Draw how the protons, neutrons and electrons are arranged in this atom.

 **c** A common isotope is $\begin{matrix}13\\6\end{matrix}C$. List the number of protons and neutrons in this isotope.

**3** Complete the following table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Radiation** | **Comprises of** | **Overall charge** | **Range in air** | **Radiation stopped by** |
| alpha |  | +2 |  | paper |
|  | electron |  | 500–1000 cm |  |
| gamma | EM wave |  | virtually infinite |  |

**4**  **a** All nuclear radiation is ionising. Explain what is meant by the term ionising.

 **b** State two ways in which someone handling radiation could reduce their risk of exposure.