

# 1. Atomic Structure

## 1.2 Isotopes

### Paper 2

Question Paper

- 1 (b) Table 1.1 gives some details of the stable naturally occurring isotopes of rhodium and iridium.

**Table 1.1**

isotope	number of protons	number of neutrons	total number of electron shells
$^{103}_{45}\text{Rh}$		58	
$^{191}_{77}\text{Ir}$			6
$^{193}_{77}\text{Ir}$			6

Complete Table 1.1.

[3]

- 2 Tellurium is an element in Group 16. The most common isotope of tellurium is  $^{130}\text{Te}$ . Its electronic configuration is  $[\text{Kr}] 4d^{10} 5s^2 5p^4$ .

- (a) Complete Table 1.1.

**Table 1.1**

	nucleon number	number of neutrons	number of electrons
$^{130}\text{Te}$			

[3]

**3** Atoms with nuclei containing an odd number of protons tend to have fewer isotopes than those with an even number of protons.

(b) Potassium also has two stable isotopes. Both isotopes have the same chemical properties.

(i) Explain why both isotopes of potassium have the same chemical properties.

.....  
 ..... [1]

**4** Gallium is a metal in Group 13 of the Periodic Table.

(a) There are two stable isotopes of gallium,  $^{69}\text{Ga}$  and  $^{71}\text{Ga}$ .

(i) State, with reference to subatomic particles, how the isotopes  $^{69}\text{Ga}$  and  $^{71}\text{Ga}$  differ from each other.

.....  
 ..... [1]

**5** Atoms contain the subatomic particles electrons, protons and neutrons. Protons and electrons were discovered by observations of their behaviours in electric fields.

(c) *Hydron* is a general term used to represent the ions  $^1\text{H}^+$ ,  $^2\text{H}^+$  and  $^3\text{H}^+$ .

State, in terms of subatomic particles in the nucleus, what is the same about each of these ions and what is different.

same .....

different .....

[1]