ATAR Year 11 Chemistry

Task 3:

Electronic structure and Trends of the periodic table.

Section 1: Multiple choice 27% (10 marks)

Question 1

C X is in period 3 and group 1.

Question 2

B X and Z only

Question 3

C Y is in group 2 of the periodic table.

Question 4

C Sodium is more electronegative than potassium.

Question 5

A Electrons cannot exist between energy levels

End of section 1

Section 2: Short answer 73% (27 marks)

Question 6

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Symbol | Atomic number | Mass number | Number of protons | Number of neutrons | Number of electrons |
| 40K+ | 19 | 40 | 19 | 21 | 18 |
| 209Bi3– | 83 | 209 | 83 | 126 | 86 |
| 234U | 92 | 234 | 92 | 142 | 92 |

(6 marks)

Question 7

a i Ca

ii Ar

iii C or Si

iv Na

v O

(5 marks)

B Ionisation energy The energy required to remove one electron from an atom (1)

Ionisation energy decreases down a group (1) as the core charge stays the same, but the number of shells (or radius) increases so valence electrons are less attracted, therefore less energy required (1)

Ionisation energy increases across a period (1) as the core charge increases, but the number of shells is constant (or radius decreases) [1]

1. **Electronegativity** [5]

Electronegativity is the ability for an atom to attract electrons in a covalent bond towards itself (1)

Electronegativity decreases down a group (1) as the core charge stays the same, but the number of shells (or radius) increases so valence electrons are less attracted, therefore less energy required (1)

Electronegativity increases across a period (1) as the core charge increases, but the number of shells is constant (or radius decreases)

1. State the ground state electron configuration of the following: [4]
   1. Berylium **2,2**
   2. Fluorine **2,7**
   3. Potassium ion **2,8,8**
   4. Sulfide ion **2,8,8**

9.

1. Identify the ion with a charge of -3 that has the electron configuration: [1]

2, 8, 8 : Has 3 extra electrons so is Phosphorous

1. Identify the ion with a charge of +1 that has an electron configuration : [1]

2,8, 8, 8\_: Has 1 less electron so is Rubidium

End of answers