

**Review for the quiz: atomic models, basic atomic structure. ANSWERS**

1. Explain why when an atom loses electrons, it is left with a positive charge?

*In the neutral atom the number of positive charges (protons) is equal to the number of negative charges (electrons); whenever the atom loses electrons, the number of positive charges prevails over the number of negative charges.*

2. What is the charge, negative or positive, of the nucleus of every atom? Explain your answer.

*The nucleus of the atom consists of a number protons and neutrons. Since neutrons have no charge, the overall charge of the nucleus is positive.*

3. What does the atomic number of each atom represent?

*By definition, the atomic number is equal to the number of protons.*

4. What is the difference between the mass number and the atomic number of an atom?

*The mass number is the mass of an individual isotope, the sum of its protons and neutrons in the nucleus. The atomic mass is the average of the masses of all the isotopes of the element taking in to account the corresponding percentage of abundance.*

5. Name two ways that the isotopes of an element differ.

*They differ by the number of neutrons and the mass number.*

6. Name the element which has the following numbers of particles: ( Use the period table )

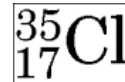
- a. 20 electrons, 20 neutrons, 20 protons: Ca, calcium  
 b. 30 protons, 35 neutrons: Zn, zinc  
 c. 5 electrons (neutral atoms): B, boron  
 d. 4 protons: Be, beryllium  
 e. 2 electrons, 4 neutrons, 3 protons (charged atom): Li, Lithium  
 f. 0 neutrons: Hydrogen

7. Complete the following table:

Isotope symbol	Mass number	Number of protons	Number of electrons (neutral atom)	Atomic Number	Number of neutrons	Element's name
<sup>41</sup> Ar	41	18	18	18	23*	Argon
<sup>56</sup> Fe	56	26	26	26	30	Iron
<sup>32</sup> S	32	16	16	16	16	Sulfur

\* 23: this is a correction. The original worksheet shows 40.

8. Provide the information (Element, Number of Protons, Atomic number, Number of electrons in neutral atoms and mass number) for the following isotopes symbols:



Element: Uranium

Lithium

Carbon

Carbon

Chlorine

No. protons: 92

3

6

6

17

Atomic number: 92

3

6

6

17

No. electrons: 92

3

6

6

17

Mass number: 238

7

12

13

35

9. Given the following information, calculate the atomic mass of sulfur, hydrogen and carbon.

<b>Sulfur</b>	$^{32}\text{S}$	95.00%
	$^{33}\text{S}$	0.76%
	$^{34}\text{S}$	4.22%
	$^{36}\text{S}$	0.014%
<b>Hydrogen</b>	$^1\text{H}$	99.985%
	$^2\text{H}$	0.015%
<b>Carbon</b>	$^{12}\text{C}$	98.89%
	$^{13}\text{C}$	1.10%
	$^{14}\text{C}$	0.01%

$$\text{S Atomic mass} = (95/100) \times 32 + (0.76/100) \times 33 + (4.22/100) \times 34 + (0.014/100) \times 36 = 32.0906 \text{ a.m.u}$$

$$\text{H Atomic mass} = (99.985/100) \times 1 + (0.015/100) \times 2 = 1.00015 \text{ a.m.u}$$

$$\text{C Atomic mass} = (98.89/100) \times 12 + (1.10/100) \times 13 + (0.01/100) \times 14 = 12.0112 \text{ a.m.u}$$