

Ch 3: Level 3 Questions

1. If the nucleus of an atom is represented as ${}^{24}_{11}\text{X}$, the atom is

A. Na B. Al C. Mg D. Br

2. The atomic mass of an element is defined as the weighted average mass of that element's

A. most abundant isotope
 B. least abundant isotope
 C. naturally occurring isotopes
 D. radioactive isotopes

3. Base your answer(s) to the following question(s) on the data table below, which shows three isotopes of neon.

Isotope	Atomic Mass (atomic mass units)	Percent Natural Abundance
${}^{20}\text{Ne}$	19.99	90.9%
${}^{21}\text{Ne}$	20.99	0.3%
${}^{22}\text{Ne}$	21.99	8.8%

In terms of *atomic particles*, state one difference between these three isotopes of neon.

4. The atomic mass of an element is calculated using the

A. atomic number and the ratios of its naturally occurring isotopes
 B. atomic number and the half-lives of each of its isotopes
 C. masses and the ratios of its naturally occurring isotopes
 D. masses and the half-lives of each of its isotopes

5. The most common isotope of chromium has a mass number of 52. Which notation represents a different isotope of chromium?

A. ${}^{52}_{24}\text{Cr}$ B. ${}^{54}_{24}\text{Cr}$ C. ${}^{24}_{52}\text{Cr}$ D. ${}^{24}_{54}\text{Cr}$

6. Base your answer(s) to the following question(s) on the information below.

The accepted values for the atomic mass and percent natural abundance of each naturally occurring isotope of silicon are given in the data table below.

Naturally Occurring Isotopes of Silicon

Isotope	Atomic Mass (atomic mass units)	Percent Natural Abundance (%)
Si-28	27.98	92.22
Si-29	28.98	4.69
Si-30	29.97	3.09

Determine the total number of neutrons in an atom of Si-29.

7. Compared to an atom of phosphorus-31, an atom of sulfur-32 contains

A. one less neutron B. one less proton
 C. one more neutron D. one more proton

8. Base your answer(s) to the following question(s) on the information below.

Naturally Occurring Isotopes of Copper

Isotope Notation	Percent Natural Abundance (%)	Atomic Mass (atomic mass units, u)
Cu-63	69.17	62.930
Cu-65	30.83	64.928

In the space below, show a correct numerical setup for calculating the atomic mass of copper.

9. What information is necessary to determine the atomic mass of the element chlorine?
- A. the atomic mass of each artificially produced isotope of chlorine, only
 B. the relative abundance of each naturally occurring isotope of chlorine, only
 C. the atomic mass and the relative abundance of each naturally occurring isotope of chlorine
 D. the atomic mass and the relative abundance of each naturally occurring and artificially produced isotope of chlorine

1.
Answer: A
2.
Answer: C
3.
Answer: Each isotope has a different number of
neutrons or different number of neutrons
or Ne-22 has two more neutrons than
Ne-20 and one more neutron than Ne-21.
4.
Answer: C
5.
Answer: B
6.
Answer: 15
7.
Answer: D
8.
Answer:
$$\frac{(0.6917)(62.930u) + (0.3083)(64.928u)}{(69.17)(62.930) + (30.83)(64.928)}$$
$$100$$
9.
Answer: C