

Expectations Assessed

- Understand the trends in periodic table
- Communicate physical and chemical properties of elements
- Analyze importance of the properties of chemical substances

Multiple Choice [Level 1 2 3]

Short Answer Instructions

- Read all parts of the question before beginning your answer.
- Use point form and do NOT waste time rewording the question in your answer.
- DESCRIBE: Make two to three points showing you understand.
- EXPLAIN: Make two to three points being sure to give information and discuss its relevance/effect.

23. Elements A, B, and C are in the same chemical group and are all silver solids at room temperature.
 Element B bursts into pink flames when it is placed in water.
 Element A sizzles slightly when it is placed in water.
 Element C sizzles and sometimes burns when it is placed in water.

a. How would A, B, and C be arranged (top to bottom) in the periodic table?

Top: C B A Bottom

- b. Explain this trend using atomic radii trend of these elements [Level 2 3]

① From right to left, atomic radii trend is increasing.
 ② From up to bottom, atomic radii trend is increasing.

24. Explain how Bohr's line spectrum of hydrogen experiment was able to further refine Rutherford's planetary model of the atom. Describe what Bohr saw from this experiment and his interpretation of the data.

Bohr saw from this experiment like electrons levels around nucleus. GS ↑ 54K

[Taking it Further] Explain 1 limitation of the Rutherford model. [Level 1 2 3 4]

For the Rutherford model, each level can't be more than 8 electrons (the first level just can be 2 electrons). X

Name

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- 1 (A) (B) (C) (D) (E) 14 (A) (B) (C) (D) (E)
 2 (A) (B) (C) (D) (E) 15 (A) (B) (C) (D) (E)
 3 (A) (B) (C) (D) (E) 16 (A) (B) (C) (D) (E)
 4 (A) (B) (C) (D) (E) 17 (A) (B) (C) (D) (E)
 5 (A) (B) (C) (D) (E) 18 (A) (B) (C) (D) (E)
 6 (A) (B) (C) (D) (E) 19 (A) (B) (C) (D) (E)
 7 (A) (B) (C) (D) (E) 20 (A) (B) (C) (D) (E)
 8 (A) (B) (C) (D) (E)
 9 (A) (B) (C) (D) (E)
 10 (A) (B) (C) (D) (E)
 11 (A) (B) (C) (D) (E)
 12 (A) (B) (C) (D) (E)
 13 (A) (B) (C) (D) (E)

20 Exam Image (7038)

26. An element has two naturally occurring isotopes. Isotope A has a mass of 10.01 amu and a natural abundance of 19.9%. Isotope B has a mass of 11.01 amu and a natural abundance of 80.1%. Calculate the average atomic mass of the element. [Level 1 2 3]
- SHOW YOUR WORK

$$= \frac{(10.01 \times 19.9\%) + (11.01 \times 80.1\%)}{2} = 10.94$$

27. Explain why an Al atom is larger than an Cl atom. [Level 1 2 3]
- Because an Al atom has less valence electron, so a Al atom is larger than an Cl atom.

28. a. Identify the element with the lowest and highest electron affinity from: Zn, N, F, Si
- Lowest: Zn Highest: F

- b. [Taking it Further] Explain the difference referring to at least two factors affecting affinity. [Level 1 2 3 4]

① From left to right, affecting affinity was increasing.

② From bottom to top, affecting affinity was decreasing.

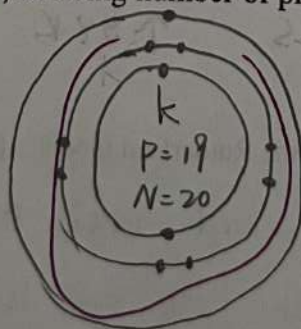
29. Explain why strontium has a lower ionization energy than magnesium, referring to at least two factors in your answer. [Level 1 2 3]

① Because ionization energy trends is from left to right was increasing, and from bottom to top, ionization energy is increasing, and strontium was more left and more bottom, so it has a lower ionization energy than magnesium.

30. [Taking it Further] If an element has a low electron affinity would it most likely have a high or low ionization energy? Explain. [Level 1 2 3 4]

It most likely have a high ionization energy, because the trends of ionization energy and electron affinity is same.

31. Draw a Bohr-Rutherford diagram for K, showing number of protons and neutrons. [Level 1 2 3]



2. [Taking it Further] Explain the importance of Thompson's model of the atom to the design of Rutherford's experiment and the development of his planetary model of the atom. [Level 1 2 3 4]

Because Thompson's model of the atom shows the motion of the electron to help the design of Rutherford's experiment.

ONUS SECTION

33. a. Complete the following chart ON THE TEST SHEET for elements X, Y and Z.

Element	Electron configuration
W. <u>N</u>	$1s^2 2s^2 p^3$
X. <u>Fe</u>	$1s^2 2s^2 p^6 3s^2 p^6 d^2 4s^2$
Y. <u>Sc</u>	$1s^2 2s^2 p^6 d^1 4s^2$
Z. <u>Nb</u>	$1s^2 2s^2 p^6 3s^2 p^6$