



Chemistry

Name: _____

Section _____ CH 6 PRACTICE EXAM Date: _____

A. Multiple Choice: Circle the best answer for each question. (30 points)

Use the table below to answer questions 1 and 2.

Atomic and Ionic Radii of Some Elements

Group 1

Particle	Radius (pm)
Li atom	130.
Li ⁺ ion	78
Na atom	160.
Na ⁺ ion	98
K atom	200.
K ⁺ ion	133
Rb atom	215
Rb ⁺ ion	148

Group 17

Particle	Radius (pm)
F atom	60.
F ⁻ ion	133
Cl atom	100.
Cl ⁻ ion	181
Br atom	117
Br ⁻ ion	?
I atom	136
I ⁻ ion	220.

- The radius of a bromine ion is approximately
(1) 117 pm (2) 181 pm (3) 195 pm (4) 221 pm
- The name and the charge of the particle gained by a fluorine atom when the fluorine atom becomes an ion are
(1) neutron, 0 (2) positron, +1 (3) proton, +1 (4) electron, -1
- Which elements have the most similar chemical properties?
(1) Si, As, and Te (2) N₂, O₂, and F₂ (3) Mg, Sr, and Ba (4) Ca, Cs, and Cu
- In which area of the Periodic Table would the most nonmetallic elements be found?
(1) lower left (3) lower right
(2) upper left (4) upper right
- In a bond between an atom of carbon and an atom of fluorine, the fluorine atom has
(1) weaker attraction for electrons (3) smaller number of first shell electrons
(2) stronger attraction for electrons (4) larger number of first shell electrons
- As the elements in Period 3 are considered in order of increasing atomic number, there is a general *decrease* in
(1) atomic mass (2) atomic radius (3) electronegativity (4) first ionization energy
- Which list of elements consists of a metal, a metalloid, and a nonmetal?
(1) Li, Na, Rb (2) Cr, Mo, W (3) Sn, Si, C (4) O, S, Te

A. Multiple Choice: (continued)

8. What is the most likely electronegativity value for a metallic element?
(1) 1.3 (2) 2.7 (3) 3.4 (4) 4.0
9. Elements on the Periodic Table are arranged in order of increasing
(1) atomic mass (2) atomic number (3) molar mass (4) oxidation number
10. Which atom has the *weakest* attraction for the electrons in a bond with an H atom?
(1) Cl atom (2) F atom (3) O atom (4) S atom

B. Short Answer:

1. In the ground state, which noble gas has atoms with the same electron configuration as a magnesium ion? [2]

2. Explain, in terms of electrons, why an atom of magnesium forms an ion that has a smaller radius than its atom. [2]

3. State the general relationship between the atomic number and the atomic radius for the Period 3 elements. [2]

4. Which ion is least likely to form: Na^+ , Cl^- , Cl^+ or Ar^+ . _____ [2]
Explain your answer. [2]

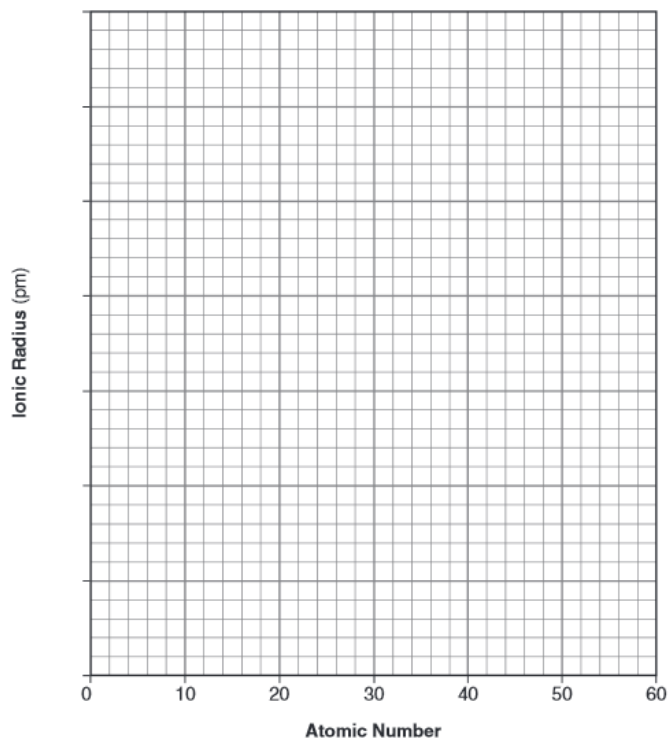
5. Generally, electron affinity increases with increasing atomic mass in period 3. Explain why Mg will not attract another electron. [2]

C. Graphing: The ionic radii of some Group 2 elements are given in the table below.

Ionic Radii of Some Group 2 Elements

Symbol	Atomic Number	Ionic Radius (pm)
Be	4	44
Mg	12	66
Ca	20	99
Ba	56	134

Ionic Radius Versus Atomic Number



1. On the grid above, mark an appropriate scale on the axis labeled "Ionic Radius (pm)". [2]
2. Plot the data in the table on the left on the graph on the right. [2]
3. Strontium (Sr) is also a Group 2 element. Estimate the radius of a strontium ion on the graph above.

$\text{Sr}^{2+} \approx$ _____ pm [2]

4. Explain why the ionic radius of a group 17 (group VIIA) element is larger than its atomic radius. [2]
