

G9 Science: Class 4 Homework1. Draw the complete Bohr-Rutherford Diagram of: **[12 marks]**

a) Sodium

b. Neon

c. ${}^{24}_{12}\text{Mg}$ 2. Draw the condensed Bohr-Rutherford Diagram for the most likely ion to form:
[12 marks]

a) Potassium

b. Sulphur

c. ${}^{19}_9\text{F}$ 3. Complete the following table: **[5 marks]**

	Symbol	Atomic Number	Mass number	p^+	n^0	e^-	charge
a)	${}^{231}\text{Ra}$						0
b)					60	47	0
c)	${}^{18}_9\text{F}^-$						
d)		96			115		+3
e)				92	148	86	

4. Which type of bond is formed in the following compounds (ionic, covalent, alloy)?
[5 marks]

- a) NaI _____
- b) CH₄ _____
- c) CH₃OH _____
- d) ZnO _____
- e) Cu _____

5. Consider the following substances: Ar H₂O₂ C₆H₁₂O₆ MgCl₂

Which of the following are: [4 marks]

- a) Elements _____
- b) Compounds _____
- c) Atom _____
- d) Molecule _____

6. Classify each of the following changes as physical or chemical. [8 marks]

- a) Ice melting _____
- b) Roasting a chicken _____
- c) Cutting carrots _____
- d) Car rusting _____
- e) A bomb exploding _____
- f) Mixing salt and pepper _____
- g) Breaking glass _____
- h) Digesting food _____

7. Convert each of the following to the units indicated. [3 marks]

- a) 0.004 kL = _____ mL
- b) 701 000 mg = _____ g
- c) 2.7152 cg = _____ mg

8. Label the following using the diagram and word bank below: **[5 marks]**

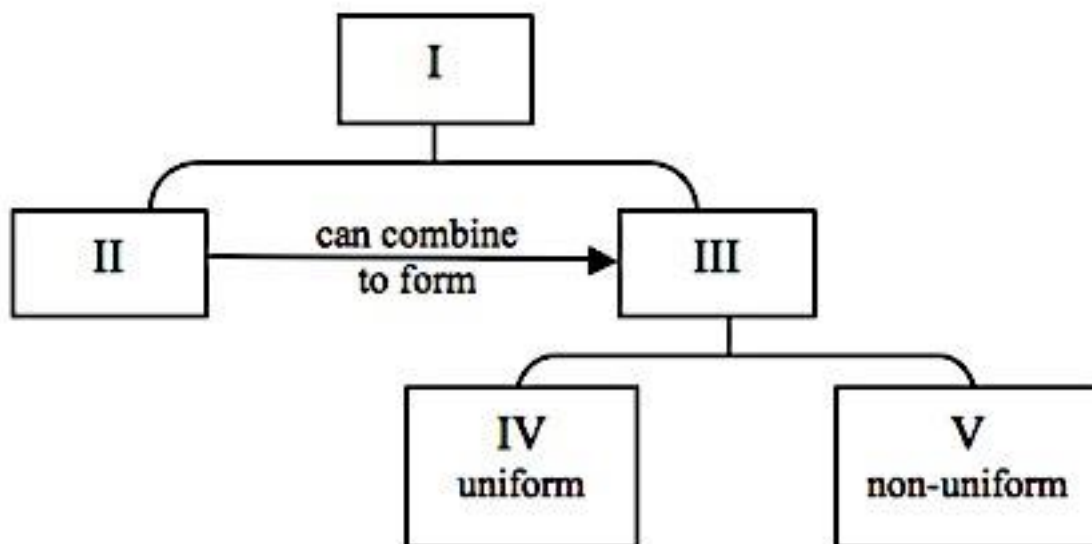
Mechanical mixture

Matter

Solutions

Pure Substances

Mixtures



I. _____

II. _____

III. _____

IV. _____

V. _____

9. Label the following using the diagram and the word bank below: **[6 marks]**

Sublimation

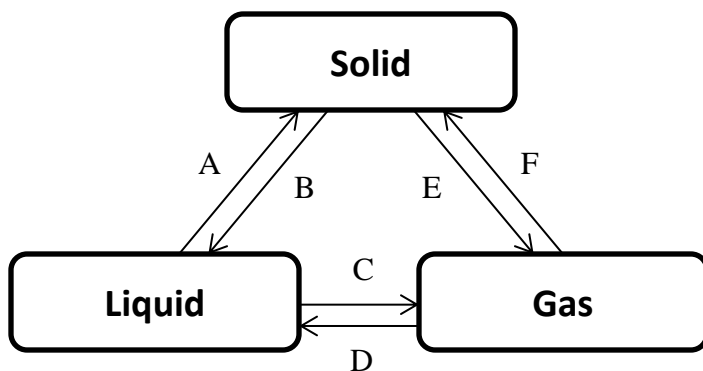
Freezing

Melting

Evaporation

Deposition

Condensation



A. _____

B. _____

C. _____

D. _____

E. _____

F. _____

Challenge Problems

10. The density of pure solid copper is 8.94 g/ml. What volume does 5kg of copper occupy? Use the GRASS method, show all work. **[5 marks]**
11. What is the mass of a 15cm (length) cube of iron if the density of iron is 7.87 g/cm³? Use the GRASS method, show all work. **[5 marks]**
12. What is the difference between the two isotopes of carbon: carbon-14 and carbon-12? What are their functions? **[5 marks]**
13. What is the difference between an ionic bond and a covalent bond? Provide an example of each. **[4 marks]**
14. What is the same about the electron arrangement of all halogen elements? What group of elements are they most likely to react with: Noble Gases, Alkali Metals, Alkaline Earth Metals or Other Halogens? **[3 marks]**

15. What is the difference of chemical and physical change with respect to the behavior and fate of the molecules? What are some things you can look for to tell the difference?
[6 marks]

16. Using complete Bohr-Rutherford diagrams, draw the formation of Beryllium chloride.
[4 marks]

17. Which two of the three states of matter (Solid, Liquid, Gas) are very difficult to compress into a smaller volume? Explain your thinking. **[3 marks]**

18. Design a method to test for hydrogen gas. **[3 marks]**

19. In a flashlight bulb, is the light given off by the filament a sign that the filament is undergoing a chemical change? Explain your answer. **[3 marks]**

20. In a boiling pot of water on the stove, is the formation of the bubbles a sign that the water is undergoing a chemical change? Explain your answer. **[3 marks]**