



## Unit 2 – Matter and Chemical Change

### Unit Test

Student Name \_\_\_\_\_

Class \_\_\_\_\_

#### Section 1

#### Properties of Matter

Aluminum foam is used to create lighter, safer cars. The reason that a lighter car is a safer car is because aluminum foam is ...

- A. less rigid
- B. much cheaper than aluminum
- C. unable to be dented
- D. able to absorb more impact energy

2.



This symbol means ...

- A. flammable
- B. corrosive
- C. dangerously reactive
- D. biohazardous

3.



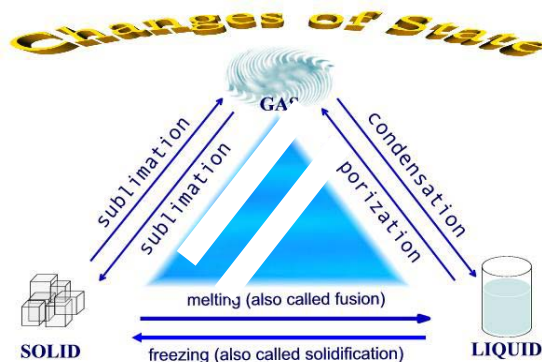
This symbol means ...

- A. caution
- B. warning
- C. danger
- D. special care

4.

When a substance undergoes a change of state it can use energy or give off energy. The change that occurs when a substance changes **from a gas to a solid** is referred to as ...

- A. fusion
- B. deposition
- C. sublimation
- D. condensation



5. A substance's ability to resist being scratched is the physical property of matter known as ...

- A. ductility
- B. malleability
- C. hardness
- D. conductivity

6. An obvious chemical property of pancakes is ...

- A. ability to combine ingredients easily
- B. the positive reversibility of the process
- C. the heat it gives off
- D. the new substance that appears to form

7. The difference between an element and a compound is that an element ...

- A. is a pure substance and a compound is a mixture
- B. has only one substance, while a compound has more than one substance
- C. can be made into a mixture, but a compound cannot
- D. Can be a pure substance, while a compound cannot be a pure substance

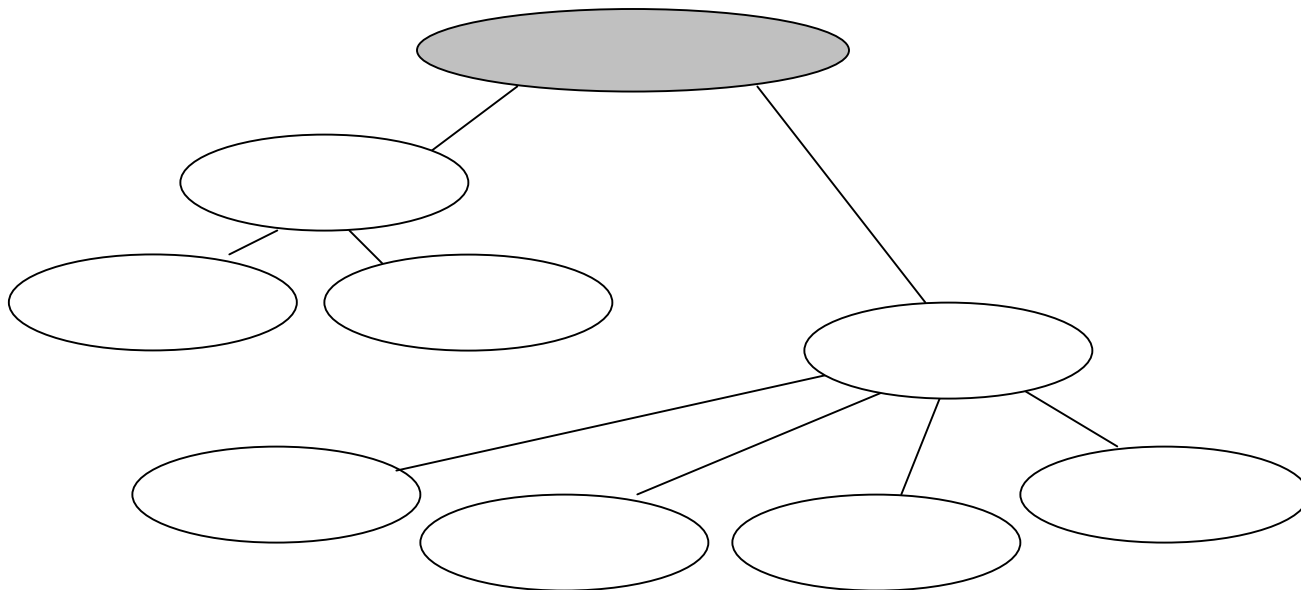


## Unit 2 – Matter and Chemical Change

8. Use the following words to complete a visual organizer, showing the relationships between and among the words provided. Use each word only once.

Pure Substances, Colloids, Matter, Solutions, Compounds,

Mixtures, Mechanical Mixtures, Suspensions, Elements





9. A cloudy mixture in which the particles of the suspended substance are so small they cannot be easily separated out is called a ...
- mechanical mixture
  - suspension
  - colloid
  - solution
10. Physical or chemical change can be identified by evidence. When a substance undergoes a chemical change the pieces of evidence used include all of the following, **EXCEPT** ...
- colour
  - odour
  - state
  - formation of a gas
11. Freeze-drying is a technique used to preserve food for long periods of time. In the freeze-drying method the first step is to ...
- add hot water
  - put it in a pressure chamber
  - freeze the water, in the food
  - refrigerate the food
12. MRE's are especially useful for astronauts, soldiers and mountain climbers. They are heated in a special package called a 'flameless ration heater'. MRE stands for ...
- Military Ration Envelope
  - Mission Ration Envelope
  - Meal, Ready to Eat
  - Meals Requiring Energy



## Unit 2 – Matter and Chemical Change

### Section 2

### Nature of Matter Over Time – Periodic Table

13. The first chemists lived before 8000 B.C. Because metals had not been discovered, humans used only simple tools made from these ...
- A. rocks, scissors and paper
  - B. wood pulp and ink
  - C. stones and bones
  - D. plants and animal remains
14. This is derived from “khemeia” (a Greek word ) ...
- A. Caustic
  - B. Chemistry
  - C. Copper
  - D. Copernicus
15. ‘alkimiya’ ( an Arabic word ) translates as ...
- A. Alchemy
  - B. Alkali
  - C. Apostle
  - D. The Chemist
16. The scientist who developed the ‘billiard ball’ model of the atom was ...
- A. Lavoisier
  - B. Boyle
  - C. Libeu
  - D. Dalton
17. Most models of the atom include the sub-atomic particles, called electrons, orbiting the nucleus. The quantum model of the atom has these electrons in ...
- A. a charged cloud
  - B. fixed orbits
  - C. random patterns
  - D. scattered orbits
18.  This ancient element symbol means ...
- A. copper
  - B. silver
  - C. gold
  - D. tin
19.  This element symbol means ...
- A. oxygen
  - B. hydrogen
  - C. silver
  - D. carbon
20. Demitri Mendeleev wanted to find a pattern that would allow him to predict the properties of elements not yet discovered. By using information cards he charted the pattern that seemed to work. The characteristic that showed that the properties of elements vary periodically was the ...
- A. color
  - B. atomic number
  - C. atomic mass
  - D. symbol



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21.

19	2
<b>K</b>	8
Potassium	8
39.0983	1

In this element –  
**Potassium** –  
19 refers to the ...

- A. mass
- B. reactivity
- C. number
- D. Ion charge

22.

19	2
<b>K</b>	8
Potassium	8
39.0983	1

In this element –  
**Potassium** –  
39.0983 refers to the ...

- A. mass
- B. reactivity
- C. number
- D. Ion charge

Use this periodic table information to answer the next two questions

1.0																	4.0
<b>H</b>																	He
1																	2
6.9	9.0											10.8	12.0	14.0	16.0	19.0	20.2
Li	Be											B	C	N	O	F	Ne
3	4											5	6	7	8	9	10
23.0	24.3											27.0	28.1	31.0	32.1	35.5	39.9
Na	Mg											Al	Si	P	S	Cl	Ar
11	12											13	14	15	16	17	18
39.1	40.1	45.0	47.9	50.9	52.0	54.9	55.8	58.9	58.7	63.5	65.4	69.7	72.6	74.9	79.0	79.9	83.8
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
85.5	87.6	88.9	91.2	92.9	95.9	(99)	101.1	102.9	106.4	107.9	112.4	114.8	118.7	121.8	127.6	126.9	131.3
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
132.9	137.3	138.9	178.5	181.0	183.9	186.2	190.2	192.2	195.1	197.0	200.6	204.4	207.2	209.0	(210)	(210)	(222)
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86

23. In the table above the following elements would be described as the Noble Gases.
- A. He, Ne, Ar, Kr, Xe, Rn
  - B. Li, Na, K, Rb, Cs, Fr
  - C. Be, Mg, Ca, Sr, Ba, Ra
  - D. Rf, Db, Sg, Bh, Hs, Mt, Uun
24. How many neutrons does Potassium have?
- A. 15
  - B. 17
  - C. 19
  - D. 20
25. As you move across the periodic table the properties of the elements change. The most reactive metals include ...
- A. sodium and lithium
  - B. iron and copper
  - C. aluminum and carbon
  - D. lead and zinc
26. The periodic table is organized by the patterns of the properties of the elements. The rows in the periodic table vary with the amount of elements they contain. These rows are called ...
- A. groups
  - B. families
  - C. periods
  - D. metals



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### Section 3

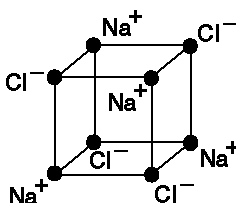
### Formation of Ionic and Molecular Compounds

27. Compounds are formed when elements combine in different chemical reactions. This identifies which elements combine and how many of them are present in the compound.
- Chemical Name
  - Atomic Mass Unit
  - Atomic Number
  - Chemical Formula
28. In the formula for baking soda [  $\text{NaHCO}_3(\text{s})$  ] the following indicates how many atoms are present in each molecule ...
- 1 sodium, 1 hydrogen, 3 carbon dioxide
  - 1 atom of each element
  - 1 sodium, 1 hydrogen, 1 carbon, 3 oxygen
  - 1 sodium, 1 hydrogen, 1 calcium and 3 oxygen
29. In the formula for baking soda  $\text{NaHCO}_3(\text{s})$  the (s) indicates that this molecule is ...
- safe
  - stable
  - strong
  - solid
30. Pure substances formed as a result of the attraction between charged particles of opposite charges are ...
- Stable elements
  - Ionic compounds
  - Molecular compounds
  - Charged elements
31. When ionic compounds are formed, the ions combine to form a ...
- crystal
  - block
  - irregular pattern
  - cloud
32. When sodium (a very reactive metal) is placed in chlorine (a green gas), the sodium explodes with a bright yellow flame. As it burns, this white, coarse-grained powder is produced.
- silicon
  - carbon
  - alum
  - salt
33. A group of ions 'that act as one' are called ...
- Subatomic ions
  - Polyatomic ions
  - Molecular ions
  - Aqueous ions
34. When naming ionic compounds there are two rules to remember: The first is that the name of the metal is always placed first, the second is the name of the non-metal ion(s) changes to ....
- 'ous'
  - 'ade'
  - 'ide'
  - 'ate'



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35. The ion charges of a particular element will help you determine the chemical formula for the compound that is formed. Calcium [  $\text{Ca}^{2+}$  ] combines with chlorine [  $\text{Cl}^{-}$  ] to produce Calcium Chloride. The correct formula for Calcium Chloride is ...
- A.  $\text{Ca}_2\text{Cl}$   
B.  $\text{CaCl}_2$   
C.  $2\text{CaCl}$   
D.  $\text{Ca}_2\text{Cl}$
36. The alkali metals include Lithium and Sodium, each having an ion charge of 1+, are often reactive with the elements that have an ion charge of 1-. The group of elements that alkali metals react with are called the ...
- A. Halogens  
B. Earth Metals  
C. Non-Metals  
D. Metalloids
37. This type of lattice structure represents the compound, **sodium chloride**.



The characteristic that identifies this compound as an ionic compound is its **distinct crystal** ...

- A. size                      B. shape                      C. ion                      D. element
38.  $\text{N}_2\text{O}_3$  is a molecular compound. The chemical name - following the rules for naming molecular compounds - for  $\text{N}_2\text{O}_3$  is ...
- A. trinitrogen oxide  
B. dinitrogen oxide  
C. trinitrogen dioxide  
D. dinitrogen trioxide
39. Sugar  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$  is a molecular compound. This compound contains ...
- A. 3 carbon atoms, 4 hydrogen atoms and 2 oxygen atoms  
B. 3 calcium atoms, 4 helium atoms and 2 organic atoms  
C. 12 carbon atoms, 22 hydrogen atoms and 11 oxygen atoms  
D. 12 calcium atoms, 22 helium atoms and 11 oxidizing atoms
40. Use the information in the following table to answer this question.

Compound	Formula	Melting Point °C	Boiling Point °C
baking soda	$\text{NaHCO}_3$	$455^\circ$	$1550^\circ$
carbon dioxide	$\text{CO}_2$	sublimates	$-79^\circ$
rubbing alcohol	$\text{CO}_3\text{H}_8\text{O}$	$-90^\circ$	$82^\circ$
salt	$\text{NaCl}$	$801^\circ$	$1413^\circ$

- The molecular compounds from the table above are ...
- A. baking soda and salt  
B. rubbing alcohol and salt  
C. carbon dioxide and baking soda  
D. carbon dioxide and rubbing alcohol
41. A Tetra Pak is a drink container that is used by manufacturers to provide juice in a handy convenient format. Tetra means ...
- A. recyclable  
B. four  
C. wax paper  
D. convenient



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### Section 4

### Chemical Reactions

42. A chemical reaction takes place when two or more ...

- A. molecular compound are mixed
- B. ionic compounds are mixed
- C. substances are mixed
- D. substances combine to form new substances

43. Use the following chemical reaction word equation to answer the question.



The reactants in this chemical word equation are ...

- A. wood and oxygen
- B. carbon dioxide and water
- C. oxygen and energy
- D. wood and energy

44. A chemical reaction occurs when this evidence is present ...

- A. a solution is formed
- B. a change of state occurs
- C. energy is needed or released
- D. the reaction is reversible

45. The following word equation identifies what happens when hydrogen peroxide is left out in the sun. It changes to water and oxygen gas.

- A. Water + Oxygen  $\longrightarrow$  Hydrogen peroxide
- B. Hydrogen peroxide + Energy  $\longrightarrow$  Water + Oxygen
- C. Water + Energy + Oxygen  $\longrightarrow$  Hydrogen peroxide
- D. Hydrogen peroxide + Oxygen  $\longrightarrow$  Water + Energy

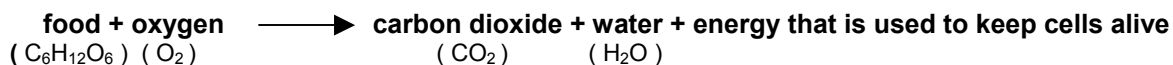
46. The reaction above is classified as ...

- A. catalytic
- B. exothermic
- C. endothermic
- D. oxidization

47. Fire keeps going because of three factors. These factors are ...

- A. fire - water - air
- B. fire - fuel - air
- C. fuel - air - energy
- D. fuel - air - heat

48. The following reaction takes place in the cells in your body.



This word equation represents ...

- A. cellular respiration
- B. photosynthesis
- C. transpiration
- D. combustion



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49. The **Law of Conservation of Mass** states that mass ...
- A. will be created in any chemical reaction between two or more substances
  - B. is created but not destroyed in a chemical reaction
  - C. is destroyed and can be recreated in an endothermic reaction
  - D. is neither created nor destroyed in a chemical reaction
50. The only statement below that is true about a closed system compared to an open system is that ...
- A. only reactants are present in the closed system
  - B. only products are present in the closed system
  - C. products and reactants are trapped in a closed system
  - D. products and reactants are free in an open system
51. There are four factors that can affect the rate of a chemical reaction. The factor below that does not belong is ...
- A. the presence of a catalyst
  - B. the concentration of the products
  - C. the temperature of the reactants
  - D. the surface area of the reactants
52. This is required by many reactions that break down food in the body, otherwise higher temperatures would be needed – making it deadly for the human body..
- A. enzymes
  - B. reactants
  - C. products
  - D. oxygen
53. In terms of factors affecting reaction rate in a chemical reaction, only this is true about **concentration** – the greater the concentration of the ...
- A. reactants the slower the reaction.
  - B. products the slower the reaction.
  - C. reactants the faster the reaction.
  - D. products the faster the reaction.
54. In terms of factors affecting reaction rate in a chemical reaction, only this is true about **temperature** – the more heat removed from the ...
- A. reactants the slower the reaction.
  - B. products the slower the reaction.
  - C. reactants the faster the reaction.
  - D. products the faster the reaction.
55. In terms of factors that affect reaction rate in a chemical reaction, only this is true about **surface area** – to speed up the reaction ...
- A. decrease the surface area of the products
  - B. decrease the surface area of the reactants
  - C. increase the surface area of the products
  - D. increase the surface area of the reactants