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Review Particle Model, Density, Properties and Chemical Reactions Test

1. Determine if each statement is referring to a solid, liquid or gas.
   a- The have no forces of attraction. Gas
   b- They have a medium force of attraction. Liquid
   c- They are very far apart. Gas
   d- They have very strong forces of attraction. Solid
   e- They have little movement. Solid
   f- They take up a lot of space and are free to move. Gas
   g- The two that have a definite shape and volume. solid & liquid
   h- The two that are non-compressible. Liquid & solid

2. What happens to solids, liquids and gases when they are heated?
   The bonds weaken. There is more space between the particles and they move faster.

3. State whether the following examples are fusion, solidification, evaporation, condensation, sublimation or deposition.
   a- Water turns to gas. evaporation
   b- Moth balls give off a bad odour. deposition
   c- Popsicles melt in the sun. fusion
   d- J-ellO hardens in the fridge. solidification
   e- Your windshield is full of water in the morning. condensation

4. Determine if the following will have an increase or decrease in temperature and an increase or decrease in energy.

	Inc. or dec. in temperature	Inc. or dec. in energy
Ice melts	Increase	Increase
Water evaporates	Increase	Increases
Gas condenses	decreases	decreases

5. Explain if water is the same as a liquid, solid or gas. Water is the same as a liquid. Both will take the shape and volume of a container it is put into. The bonds are stronger than in a gas but weaker than in a solid for both. There is more space and the particles move faster than in a solid, but slower than in a liquid

6. Why is it more important to have a characteristic property than a non characteristic one?
   Because a characteristic property is specific and identical to only one substance while you need more than one non-characteristic property to identify a substance.

7. How can you use many non-characteristic properties to identify a solid?
   Example you can use two non-charateristic properties, mass and volume, and do the math to find a characteristic property, the density.

8. You put a chain in 50 mL of water. The water rises to 55 mL with the chain. The chain had a mass of 25 g. What is the density of the chain?

5 g/mL

9. A cube had a length of 3 cm, a height of 5 cm and a width of 7 cm. Its mass was 16 g. What is the cube's density?

0.152 g/cm³

10. An orange was put into 15 mL of water. The water rose to 22 mL with the orange. The orange's mass was 4 g. What is the density of the orange? 7 mL

0.571 g/mL

11. 30 mL of a liquid was put into a cylinder weighing 25 g. The liquid and cylinder together weighed 55 g. What is the density of the liquid and what is the liquid?

* (water displacement) g/mL

weigh it graduated cylinder

12. You have an unknown liquid who's mass is 7 g and volume is 6.5 mL. Explain how the mass and volume of a liquid are found and determine if the unknown liquid is water.

You divide the mass by the volume to find the characteristic property, the density which is 1.08 g/mL

13. Explain the procedure in detail to find the density of a regular solid.

You need to find the mass → PUT the object on a triple beam balance. The you find the volume → Measure Length x width x height And divide the mass by the volume to get the density.

14. Explain in detail the procedure to find the density of an irregular solid.

You find the mass → weigh a container, then put the solide in the container and weigh it, substract the weight with the solid minus without. The fill a overflow can with water, put the solid in and measure the amount of water that goes in the graduated cylinder. calculate Mass divided by volume.

15. Use checkmarks and X's to fill in table for the reaction of each substance.

	CCP	BLP	RLP	Conductivity
Acid	X	X		X
Base	X		X	X
Distilled water	X			
Salt water	X			X
Alcohol				

16. What test allows you to distinguish between saltwater and distilled water?

Distilled water does not conduct electricity. While salt water does

17. What is the characteristic test for acids and bases?

Blue & red litmus paper

18. How will alcohols be identified? It does not contain water, is not acid nor base. And does not conduct electricity.

19. Fill in the table for the gas tests and results.

	Test	Result
Oxygen	glowing splint	relight
Carbon dioxide	lime water	white precipitate
Hydrogen	lit splint	pop sound

20. You are given three liquids in a dropper bottle, one is salt water, the other is a base and the third is alcohol. You need to determine which liquid is in which dropper bottle. Explain the tests you can do for each liquid and give the expected result.

First drip the three liquids on a red lit mus paper to see which one is a base. Once you found it, drip the two other liquids on a cup to find which one has water since Alcohol does not contain water. The last test is to find if the liquids conduct electricity with an conductivity indicator. Alcohol does not conduct electricity.

21. Fill in the table for synthesis and decomposition reactions.

	Explanation	Mass change	What are the products
Synthesis	complex molecule formed by adding 2 simple molecules	bigger mass	→ 1 compound
Decomposition	Breaking down a complex molecule to 2 simple molecules	smaller mass	→ 1 element

22. Explain the difference between an element and compound.

Both are a pure substance but an element has only one atom while a compound has two or more atoms. different

23. What is produced when 2 elements bond? What happens to the mass?

The process of synthesis. A complex molecule is formed by adding two simple molecules. The mass increases.

24. What is produced when a compound breaks down? What happens to the mass?

The process of decomposition. Two simple molecules are created by dividing one complex molecule. The mass decreases

25. You are given 3.0 g of brown powder in a crucible which is heated. At the end of the experiment, you obtain a silver colored solid and a gas that has accumulated in a flask. The mass of the silver colored solid is 2.80 g and the mass of the gas is 0.20 g. The gas that was produced was brought close to a flaming splint which caused a popping sound.

A-Explain why we can conclude that only two substances were produced after the brown powder was heated. When the ~~brown~~ brown powder was heated, a gas escaped and the brown powder changed into a silver solid since the gas wasn't present anymore. decomposition

B- Explain why we can conclude that the original brown powder was not an element.

It contained at least 2 types of particles, the gas is one, the silver solid is another.

C- Explain which gas was produced after the reaction.

hydrogen since there was a popping sound.

Multiple choice practice

26. Which answer best explains how to find the mass and volume of a cube?

	Mass	Volume		Mass	Volume
A	Liquid mass	Water displacement	C	Water displacement	LxWxH
B	Weigh it	Water displacement	D	Weight it	LxWxH

27. In the laboratory, you do various tests on a liquid and note the following results :

1. The liquid makes cobalt chloride paper turn pink.
2. The density of the liquid is 1.2 g/mL.
3. The liquid has no effect on either red or blue litmus paper.

Which of the following statements is true?

A) The liquid is pure water.

B) The liquid is an acidic solution

C) The liquid is a mixture of water and another substance.

D) The liquid is a basic solution

28. You conducted a laboratory experiment to identify the properties of an unknown liquid. These properties are as follows :

- The liquid turns cobalt chloride paper pink.
- The liquid turns blue litmus paper red.
- The liquid conducts electricity.
- The liquid has a density of 1.05 g/cm^3.

Given these properties, which of the following statements is true?

A) The unknown liquid is distilled water.

B) The unknown liquid is an acidic solution.

C) The unknown liquid is a basic solution.

D) The unknown liquid is a neutral solution.

29. A group of 4 students are given two unknown liquids. They need to determine whether the two substances are the same or different. Each student proposes a different experiment to solve the question.

1- The first student proposes to determine the density of the liquids
2- The second proposes to weigh the 2 liquids
3- The third says to find the freezing point of the liquids
4- The forth says to do a litmus paper test on the liquids

Which student(s) is right?

A) 1
B) 3 and 4
C) 1 and 2
D) 1 and 3

30. You are given three beakers containing different substances. You compile your observations in the table below :

Observations	Beaker 1	Beaker 2	Beaker 3
State	liquid	liquid	liquid
Colour	colourless	colourless	colourless
Volume	100 mL	125 mL	120 mL
Cobalt chloride paper	turns pink	no change	turns pink
Litmus paper	no change	no change	turns red
Electrical Conductivity	yes	no	yes

Which answer properly explains which beaker(s) had water present in the solutions?

A) Beaker 2 had water present in the solution because it did not conduct electricity
B) Beaker 3 had water present in the solution because the Litmus paper turned red
C) Beakers 1 and 2 had water present in the solution because the Litmus paper did not change colours
D) Beakers1 and 3 had water present in the solution because the Cobalt chloride paper turned pink

31. Using the same table from number 30, which answer properly explains which beaker(s) contained an acid?

A) Beaker 2 contained an acid because it did not conduct electricity
B) Beaker 3 contained an acid because the Litmus paper turned red
C) Beakers 1 and 2 contained an acid because the Litmus paper did not change colours
D) Beakers1 and 3 contained an acid because the Cobalt chloride paper turned pink

32. The student finds a silver rectangle and a silver cube. He wonders if they are the same substance. He decides to find the mass and volume of each object and put the information on a table.

	Mass	Volume
Rectangle	22 g	9 cm^3
Cube	18 g	13 cm^3

Determine which conclusion made was correct?

A) They can not be the same substance because they have different mass and volumes
B) They can not be the same substance because they have different densities

C) They can not be the same substance because they have different masses
D) They can not be the same substance because they are different shapes

33. In the laboratory, Christian performs experiments on two pure substances that he has been given. He records the following observations :

	Characteristic	Before Heating	After Heating to 400°C
Substance 1	Conductivity	none	none
	Colour	white	white
	Form	powder	granular
	Magnetism	none	none
	Mass	15.25 g	13.50 g
	Solubility in water	yes	no
		Note. A gas is released upon heating; this gas has a characteristic odour and is brownish in colour.	

	Characteristic	Before Heating	After Heating to 400°C
Substance 2	Conductivity	good	good
	Colour	gray	gray
	Form	rectangular	round
	Magnetism	none	none
	Mass	22.60 g	22.60 g
	Density	11.40 g/cm^3	11.40 g/cm^3
	Solubility in water	none	none

With the help of these notes, Christian has to describe each of these two substances in terms of an element or a compound.

A) Substance 1 is a compound; substance 2 could be a compound or an element.
B) Substance 1 is an element; substance 2 is a compound.
C) Substance 1 could be a compound or an element; substance 2 could be a compound or an element.
D) Substance 1 could be a compound or an element; substance 2 is an element.

33. You are taking part in a game. The object of the game is to identify an object. You are entitled to ask only one question, which property of the substance would you ask about?

A) its boiling point
B) its function
C) its shape
D) its temperature