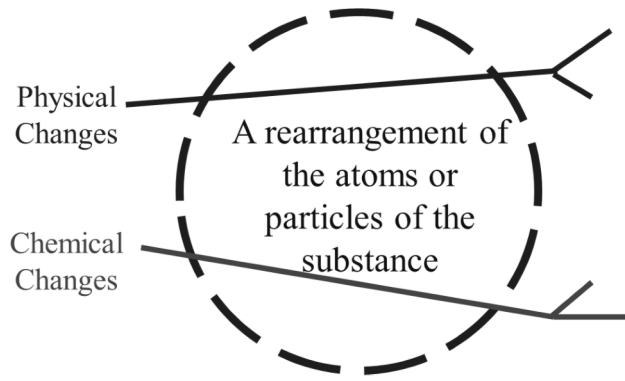


Matter Notes

OB: We will determine what matter is, what are the phases of matter, and describe various physical properties of matter. We'll also cover lots of vocabulary that you MUST MASTER ASAP

1. Matter
2. All matter is in one of these 4 "states" or phases:
A. _____ B. _____ C. _____ D. _____
3. The word aqueous means:
4. Matter can be PURE or MIXED. Pure matter includes the _____
(from the _____ table) and the millions of _____
5. Mixtures are _____ of pure _____.
6. What is a physical property of matter?
Qualities that can be... _____ and are _____
7. Some examples of physical properties include...
8. Physical Changes are also called _____ changes.
9. When matter changes phases (6 different ways, know all of these) we give them these specific names.
Solid → liquid is called _____ Liquid → solid is called _____
Gas → liquid is called _____ Liquid → gas is called _____
Solid → gas is called _____ Gas → solid is called _____

10. Chemical & Physical Changes in matter (fill in the blanks)



11. Physical changes are just _____.

Chemical changes are _____, which make new stuff.

12. What are mixtures? Mixtures are... _____

The properties of matter in a mixture... _____ . THEY ARE STILL PRESENT.

_____ ARE FORMED WHEN MAKING A MIXTURE.

_____ FORM EITHER.

14. Mixtures are either _____ or are

_____ together.

15. Mixtures that are mixed the SAME THROUGHOUT are called _____

16. Mixtures that are mixed DIFFERENTLY THROUGHOUT are called _____

Examples of mixtures

17. _____ and _____ are _____

18. _____ and _____ are _____

19. Salt water is _____ – it's the same throughout.

20. Chocolate milk is _____, because the chocolate will settle to the bottom.

21. Oil and vinegar are _____, they will not mix.

22. Mixtures can come in ALL PHASES. Examples of mixtures— Fill in this chart

Solution phase	Contains this	Mixed into this	examples
	Carbon	Iron	
	Zinc	Copper	
	Ethanol	Fruit juice	
	Acetic acid	Water	
	Oxygen	Nitrogen	
	Table salt	Water	
	Sugar + Food color	Water	

23. Draw this chart (it's the most important diagram of the whole course, please take this seriously).

24. State the Law of Conservation of Matter:

25. The sodium + chlorine are called _____

26. Sodium Chloride is the _____

27. The mass of the _____ EQUALS the mass of the _____
because all chemical reactions follows the... _____

28. If you completely react 46 grams of sodium with 70 grams of chlorine gas, how many grams of sodium chloride form?

29. If you completely react 8 g hydrogen with 64 g of oxygen, how many grams of water will form?

30. If 4 g hydrogen reacts with sufficient oxygen and forms 36 grams water, how many grams of oxygen was used up in this reaction?

31. ____ g H₂ + 28 g N₂ → 34 g NH₃

32. 223 g Fe + 96 grams O₂ → _____ g Fe₂O₃ (rust)

33. Rust has this formula: Fe₂O₃

It has ____ atoms of iron bonded to ____ atoms of oxygen for a total of ____ atoms in this compound.

34. Carbon dioxide is CO₂

It has ____ atoms of carbon bonded to ____ atoms of oxygen, for a total of ____ atoms in this compound.

35. How many atoms are in each compounds?

H₂O _____

NaCl _____

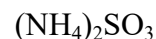
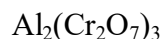
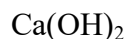
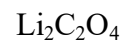
CO₂ _____

H₃PO₄ _____

H₂SO₄ _____

C₆H₁₂O₆ _____

36. These are harder, how many atoms of each kind, how many all together in each compound?

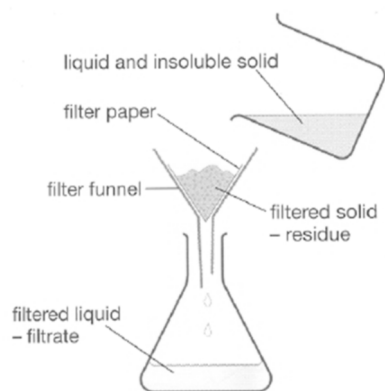


37. Mixtures are just physical blends of pure substances, they could be

_____ + _____, or _____ + _____, or
_____ + _____

38. Compounds are chemically bonded atoms, which make _____.

39. Mixtures retain the properties of the parts, _____.

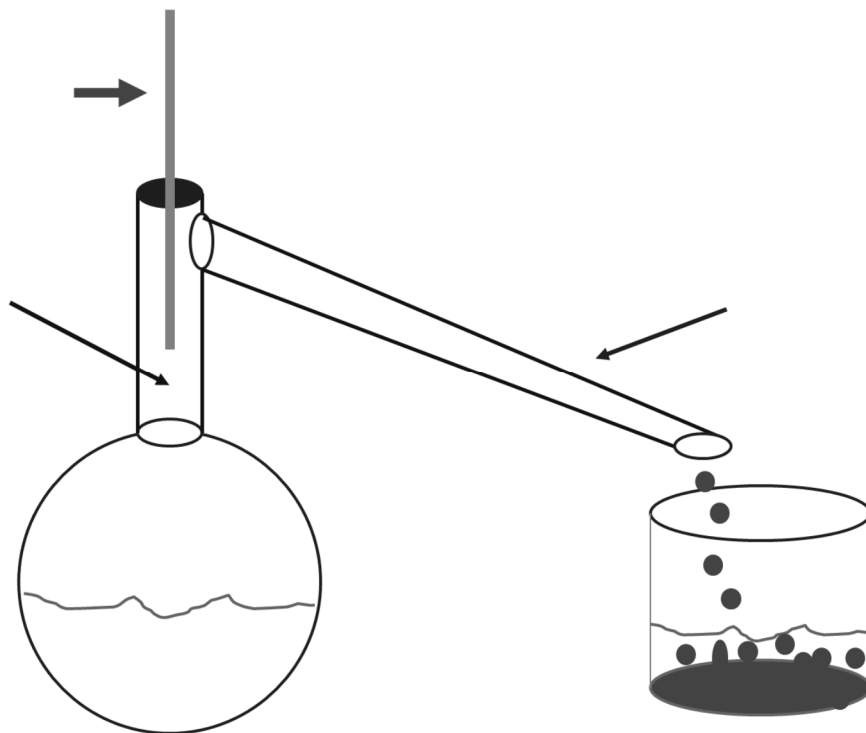


40. The “principle” that allows us to do this is that the sand is much bigger than the water particles, and sand gets stuck in the filter paper. We...



41. If you have an aqueous solution of ethanol and water and need to separate them, you can't filter them, both particles are too small to be caught in a filter paper. You can take advantage of the fact that they have a different boiling point (about 100°C for water, about 81°C for the alcohol).

42. Label the distillation apparatus



43. Here, the iron is separated from sulfur, by

_____ of the magnetic attraction of iron to the magnet, which sulfur does not have.



44. Something that we will do is called _____. It will allow the separate of colors by taking advantage of both solubility of ink in water, and density of particles.

45. You could also separate mixtures by taking advantage of differences in...

46. A chemical reaction is when 2 or more substances are combined in a chemical reaction, and we get...
_____ that form, and these have _____ properties than the reactants had.

47. How will we recognize if a chemical reaction has probably happened? We will use the acronym...

48. If these things “happen”, a chemical reaction probably happened.

T—

O—

P—

I—

C—

B—

49. A _____ shows the idea of chemical substances in a cartoon sort of way
50. Particle diagrams for a GAS, a LIQUID, and SOLID

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	phase	Shape	volume
51	Gases		
52	Liquids		
53	solids		

54. Particles are small shapes. A single shape alone indicates an _____

55. When 2 or more shapes touch, this symbolizes a _____.

56. If the 2 shapes that touch are IDENTICAL, that indicates a _____

57. Draw

Atoms	Molecules	Diatomic elements

58. How will you remember the 7 elements that are diatomic? _____ TWINS

59. A physical change is another way to say
- A. a compound forms
 - B. a phase change happens
 - C. Matter is turned into other matter
 - D. You change the shape by squishing or pushing matter

60. Match these up

GAS

Definite shape definite volume

LIQUID

Indefinite shape, indefinite volume

SOLID

Indefinite shape, definite volume

61. Define Heterogeneous:

62. Which CAN be decomposed by a chemical change? A. Co B. CO C. Hg D. Fe

63. How can we separate a mixture of salty water?

- A. A chemical reaction
- B. Filter paper
- C. With a magnet
- D. With a distillation apparatus

64. Convert the melting point of copper into centigrade degrees. *Use a formula.*

65. If 502 grams of iron completely combines with 216 grams of oxygen to form rust, how many grams of rust form?

66. When 2 elements chemically combine into a product, the product...

- A. has the same properties as the reactants
- B. has a blend of properties of the reactants
- C. has new, unique properties, unlike the reactants
- D. may or may not be similar, it depends on the elements combining

67. Count the number of atoms in these formulas

A. aluminum permanganate $\text{Al}(\text{MnO}_4)_3$

B. ammonium carbonate $(\text{NH}_4)_2\text{CO}_3$

C. nickel (III) acetate $\text{Ni}(\text{C}_2\text{H}_3\text{O}_2)_3$

68. Name the phase changes

Solid to Gas _____ Liquid to Gas _____ Solid to Liquid _____

Gas to Solid _____ Liquid to Solid _____ Gas to Liquid _____

69. State standard temperature in both Kelvin and in Centigrade. _____

70. Calculate (with a formula) the volume of 375 grams of sodium metal.

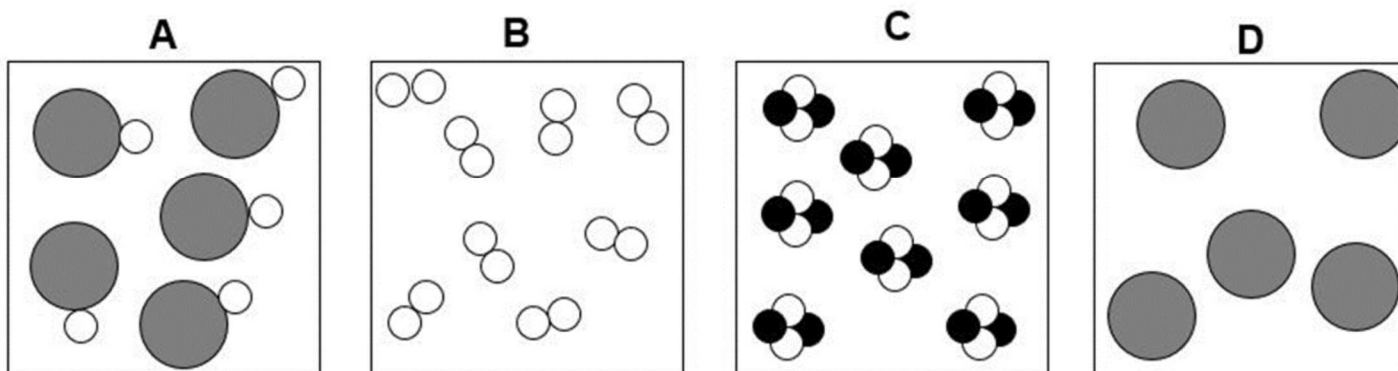
$C_7H_{16(L)} + 11O_{2(G)} \rightarrow 7CO_{2(G)} + 8H_2O_{(G)}$ This is a balanced equation for the combustion of heptane.

71. Which of the four are reactants? _____ and _____

72. Which are the products? _____ and _____

73. How many atoms in heptane? _____

74. Name some ways to separate mixtures, (use the “one liner” that tells us how to do it).



75. Which box or boxes contain

A diatomic element? _____

A mixture? _____

A monoatomic element? _____

A compound? _____