Name: _____ Date:_____Pd:_____ NOTES

Chemistry Notes: Compounds and Mixtures

What is a Pure Substance?	• A pure substance is a type of _____ that includes both _____ and _____ • Pure substances cannot be separated by _____ means such as – Distillation: _____ a liquid until it evaporates (changes to a _____), then condensing it back to a _____—different substances boil at different _____, so we can separate different substances this way. – Filtration: the process of removing _____ from liquids (or gases) – Chromatography: a way to separate different substances based on how _____ each substance moves through a filter.
What are Elements?	• We have already studied elements: An element is made of _____ kind of _____ – Found on the _____
What is a Compound?	• A compound is a pure substance that is created by _____ or more elements joining together. Ex: NaCl, _____, CO_2, _____, $NaHCO_3$, and $C_6H_{12}O_6$ • Notice that elements combine in many _____ to make compounds – Ex: H_2O and _____, CO and _____ • Compounds have different _____ from the elements that they are made of. – Just like letters combine to form _____, elements combine to form _____ – Most substances are _____, not pure _____. • Atoms are held together by _____. – Chemical bond: the "_____" that holds atoms together; involves _____
Atoms combine in predictable numbers	• <u>Chemical _____:</u> element _____ in a ratio to represent a _____ • CO_2 → 1 carbon atom ratio = 1:2 2 oxygen atoms • H_2O → ____ hydrogen atoms ratio = _____ 1 oxygen atom • Ex. C_2H_4O → ____ carbon atoms ____ hydrogen atoms ____ oxygen atoms • NOTE: we never use the _____ (the number to the _____ and slightly _____ the element symbol) ____. We simply write the element's symbol to show that there is _____ of that element in the compound.
Practice Writing Compounds	1. 2 Hydrogen and 1 Oxygen _____ 2. 4 Carbon 16 Oxygen _____ 3. 6 Carbon 12 Hydrogen 6 Oxygen _____
Why do Compounds Form?	• Compounds form to allow elements to become more _____ – _____ is flammable when it comes in contact with H_2O, and Cl_2 is a _____ – _____ is a very stable compound that is neither flammable nor toxic • Compounds that are too _____ will break down to form the more stable elements

How do Compounds Form?	• Compounds form by the interaction between the nuclei and _____ of 2 or more elements • THE OCTET RULE: an element is most _____ (happy :D) with ____ valence electrons – **Elements will join _____ to get ____ valence electrons** – Ex: CO_2 : oxygen has ____ valence electrons and carbon has ____. If the carbon shares ___ with _____ oxygen, everyone will have 8 valence electrons!
Common Compounds you NEED TO KNOW:	● Compounds are used in your _____ ● H_2O is _____ ● _____ is Carbon Dioxide ● $C_6H_{12}O_6$ is _____, and $C_{12}H_{22}O_{11}$ is _____ (both are _____!) ● _____ is table salt ● NaClO is _____ ● HCl is hydrochloric acid ● _____ is ammonia ● $NaHCO_3$ is baking soda ● $HC_2H_3O_2$ is vinegar ● O_2 is _____
What Is A Mixture?	• A mixture is the _____ combination of ____ or more substances • It is important to understand that a mixture is _____ combined • Mixtures can be separated by _____ means such as filtration, distillation, and chromatography • Mixtures can be divided into ____ groups: – _____ mixtures – Heterogeneous mixtures
How do Mixtures Form?	• Mixtures form by _____ putting ____ or more substances together (_____, cake batter, etc.). Remember: _____
What Is a Homogeneous Mixture?	• A homogeneous mixture is a mixture that's parts are _____ distributed • Homogeneous mixtures are commonly called _____. – Solution = _____ + _____ • Solute: substance ("stuff") _____ • Solvent: substance ("stuff") _____ • The solvent is present in _____ quantity • The solute is present in the _____ quantity – Ex: Salt water: _____=solute, _____=solvent – _____ is dissolved in solvent (example: saltwater = salt dissolved in water)
What Is a Heterogeneous Mixture?	• A heterogeneous mixture is a mixture that is _____ distributed. • Examples: – Iced tea: The _____ is floating at the top and therefore is not evenly distributed – Chex Mix: You may find a _____number of pretzels or Chex cereal in each handful; therefore, the mixture is _____ distributed

Properties change in solutions	• A solute changes the _____ properties of a solvent – _____ point • Solvent (water) = 32°F or ____°C • Solution (sugar water) = 15°F or ____°C • *the freezing point of a solution is _____ than the freezing point of the pure solvent* • Example: why do we put salt on a road before it snows? – Boiling point • Solvent (water) = 212°F or _____°C • Solution (sugar water) = 225°F or _____°C • *The boiling point of a solution is _____ than the boiling point of the pure solvent*
The amount of solute that dissolves can vary.	• <u>Concentration</u>: the amount of solute _____ in the solution at a certain _____ – ↑ (to _____) concentration = add more _____ – ↓ (to _____) concentration = add more _____ (_____) • Dilute: _____ solute is _____ in solvent • Concentrated: _____ solute is _____ in solvent • <u>Saturated solution</u>: has as much _____ as it can _____ at a certain _____ – _____ any more solute
What is Solubility?	• <u>Solubility</u>: the amount of _____ that will _____ in a certain amount of a certain _____ at a certain _____ – every substance as a _____ – High solubility: a _____ amount of solute can dissolve in solvent – Low solubility: a _____ amount of solute can dissolve in solvent – Insoluble: solute _____ in solvent at all. (Ex: ____ in water) – the solubility of a solute can be _____ • ↑ _____ = _____ solubility of solids, ____ solubility of gases • ↑ _____ = _____ solubility of gases
Summary: Classifying Matter