Chemistry exam 2 flashcard

If a neutral atom gains two electrons, what is the electrical charge of the atom?-1+1-2+2-2An atom loses an electron to another atom. Is this an example of a physical or chemical change? physical change involving the formation of negative ionschemical change involving the formation of neutral atomsphysical change involving the formation of positive ionschemical change involving the formation of ionschemical change involving the formation of ionsWhich of the following bonds would be the most polar? C-FC-ClC-BrC-IC-FHow many valence electrons does gallium (Ga, atomic no. = 31) have? 163313Three kids sitting equally apart around a table are sharing jelly beans. One of the kids named Billy, however, tends only to take jelly beans and only rarely gives one away. If each jelly bean represents an electron, who ends up being slightly negative? Who ends up being slightly positive? Billy ends up being slightly negative, while the two other kids are both slightly positive. Billy ends up being slightly positive, while the two other kids are both slightly negative. One of the two kids other than Billy ends up slightly negative, but Billy and the third kid will both end up slightly positive. One of the two kids other than Billy ends up slightly positive, but Billy and the third kid will both end up slightly negative. Billy ends up being slightly negative, while the two other kids are both slightly positiveHow many valence electrons does bromine (Br, atomic no. = 35) have? 1Correct! 721287Which of the following elements will most likely form an ion with a -1 charge? NaSNeClClHow many nonbonding pairs of electrons are in the following molecule?

H—H1 pair6 pairs0 pairs8 pairs

0 pairsWhat is the molecular shape of the SF_2SF2molecule?

linearbenttetrahedraloctahedral

bentWhich shows atoms in order of increasing electronegativity. Cs, Y, Ga, P, O, FF, O, Cs, Y, Ga, PCs, F, Ga, O, P, YCs, Y, Ga, P, O, FWhich of the following elements will most likely form an ion with a +1 charge? NaMgAlSiNaThe number of nonbonding (lone) electron pairs in the water molecule is _____. onetwothreefourtwoWhich of the following compounds would be ionic? CS2CF4SO2CaCl2SF5CaCl2Germanium chloride has only two atoms surrounding the central germanium atom. Why then is the germanium chloride molecule bent? There is a covalent bond between the two chlorine atoms. A lone pair of electrons on germanium pushes it to this orientation. Lone pairs of electrons on the chlorine atoms push it to this orientation. It is bent only periodically as it swings between both bent and linear shapes. A lone pair of electrons on germanium pushes it to this orientationPhosphine is a covalent compound that contains phosphorus, P, and hydrogen, H. What is its chemical formula? PHPH_2PH_3PH_4PH3The valence electron of a sodium atom does not sense the full +11 of the sodium nucleus. Why not? There are two “ non-valence shell” electrons shielding the sodium nucleus from sensing it.

There are two inner shells of electrons containing ten electrons shielding the sodium nucleus from sensing it.

Since the +11 charge is spread evenly around the entire spherical surface of the nucleus, the actual force of the charge in any given direction is greatly diminished.

The distance from the nucleus to the loosely held lone valence electron varies greatly over time. So, the average sense of charge from the nucleus is considerably less than +11.

there are two inner shells of electrons containing ten electrons shielding the sodium nucleus from sensing itWhat would be the shape of a molecule where the central atom has two nonbonding pairs while also covalently bonded to two other atoms? pyramidalbenttetrahedrallinearbentAtoms of nonmetallic elements form covalent bonds, but they can also form ionic bonds. How is this possible? This happens when one of the bonded nonmetallic elements has a strong electronegativity.

It happens when one of the nonmetallic elements loses an electron to become a positive ion.

An ionic bond results when a nonmetallic elements loses an electron to a metallic element.

Correct! An ionic bond results when a nonmetallic elements gains electrons to form an ion.

an ionic bond results when a nonmetallic elements gains electrons to form an ionWhich of the following molecules can lose a proton to form the hydroxide ion, OH?? The oxygen molecule, O2

Correct! The water molecule, H2O

The hydrogen peroxide molecule, H2O2

The hydrogen molecule

the water molecule, H2OWhich of the following elements will most likely form an ion with a +2 charge? NaCorrect! MgNeSiMgWhich of the following molecules is the most polar? Correct! HFHClCOHFHow many substituents are on the carbon atom in CH4?

122 H2Correct! 4

4The acronym VSEPR stands for _____. valence shell electron positive repulsion

very significant electron pull resonance

Correct! valence shell electron pair repulsion

valentia sia electronus partium resonancius

valence shell electron pair repulsionIs an ionic compound an example of a chemical compound, or is a chemical compound an example of an ionic compound? An chemical compound is an example of a ionic compound. Neither is an example of the other. Each is an example of the other.

Correct! An ionic compound is an example of a chemical compound.

an ionic compound is an example of a chemical compoundWhat is the name for the following polyatomic ion?

PO43-

Correct! phosphate

phosphorus oxide

phosphinate

trioxo phosphoride

phosphateIf you mix a typical aluminum ion (Al, atomic no. = 13) with a typical oxygen ion (O, atomic no. = 8), what compound is formed? Correct! Al2O3Al3O2Al3OAl2O2Al2O3How many oxide ions (O2-) are needed to balance the positive charge of a titanium ion (Ti4+)? 1Correct! 2342If carbonic acid (H2CO3) were to undergo ionization, what would one of the products be? H-CO2CO3-Correct! CO32-CO32-Which of the following statements describes a polar molecule?

The electrons in the molecule are distributed evenly throughout the molecule.

The molecules are usually not attracted to one another very strongly.

Polar molecules have the weakest intermolecular interactions with ionic compounds.

The molecules have a high degree of symmetry.

Correct! None of these statements describe polar molecules.

none of these statements describe the polar moleculesHow many electrons are used to draw the electron-dot structure for acetylene? 58Correct! 101410Polar molecules tend to be _____. symmetricalelongatedCorrect! asymmetricaldiatomicasymmetricalA hydrogen atom does not form more than one covalent bond because it _____. has only one shell of electrons

Correct! has only one electron to share

loses its valence electron so readily

has such a strong electronegativity

has only one electron to shareHow many more electrons can fit within the valence shell of a hydrogen atom? Correct! 12701If you mix a typical iodine ion (I, atomic no. = 53) with a typical barium ion (Ba, atomic no. = 56), what compound is formed? Correct! BaI2BaIBa2IBa2I2BaI2Which would you expect to have a higher melting point: sodium chloride, NaCl, or aluminum oxide, Al2O3?

The aluminum oxide has a higher melting point because it is a larger molecule and has a greater number of molecular interactions.

NaCl has a higher melting point because it is a solid at room temperature.

Correct! The aluminum oxide has a higher melting point because of the greater charges of the ions, and hence the greater force of attractions between them.

The aluminum oxide has a higher melting point because of the covalent bonds within the molecule.

the aluminum oxide has a higher melting point because of the greater charges of the ions, and hence the greater force of attractions between themGiven that the total number of atoms on our planet remains fairly constant, how is it ever possible to deplete a natural resource such as a metal?

The problem remains that not everyone recycles as they should.

Recycling only forestalls the inevitable depletion of metal resources.

The atoms don’t leave our planet, which is why naturally occurring materials never really reach the point of depletion.

Correct! The problem is with the expense of collecting metal atoms that are uniformly dispersed.

the problem is with the expense of collection metal atoms that are uniformly dispersedWhich of the following compounds has polar covalent bonds? Correct! H2OCsF2S8NeH2OWhich of the following molecules contains a polar covalent bond? Correct! H-FCl-ClH-HF-FH-FWhen is the electronic geometry of a molecule not the same as its molecular shape? Correct! when one or more of the substituents is a lone pair of electronswhen there are an odd number of electron pairs as substituentswhen there are an odd number of electrons surrounding the central atomThe geometry of a molecule is always the same as its shape. when one or more of the substituents is a lone pair of electronsWhich of the following elements has two valence electrons? NaCorrect! MgHNeMgWhich of the following molecules has the highest boiling point? BH3Correct! NH3CH4SH2NH3Which covalent bond is more polar: a sulfur-bromine (S-Br) bond or a selenium-chlorine (Se-Cl) bond? Correct! A selenium-chlorine bond should be more polar because of a greater difference in effective nuclear charge. A selenium-chlorine bond should be more polar because of a smaller difference in effective nuclear charge. A sulfur-bromine bond should be more polar because of a greater difference in effective nuclear charge. a selenium-chlorine bond should be more polar

because of a greater difference in effective nuclear chargeThe neon atom tends NOT to lose any electrons to form a compound because _____. Correct! it already has a full valence shellthat would result in a negative ionits electrons are paired together within the same orbitalsthe ionization energy is so lowit already has a full valence shellThere is more gold in 1 km3 of the ocean than the amount of gold mined in all of recorded history. How come we do not mine the oceans? It is too dilute to separate easily. It would take too much energy. It would cost too much. Correct! all are correctall are correctCalcium fluoride, CaF2, is an example of _____. Correct! an ionic compounda metallic compounda covalent compounda polar covalent compoundan ionic compoundHow many electrons are used to draw the electron-dot structure for calcium chloride? 46You Answered8Correct Answer1616What is the molecular shape of the water molecule?

pyramidalCorrect! benttetrahedralT-shapedlinear

bentWhich bond is most polar? H-NN-CC-CCorrect! O-HO-HList the following bonds in order of increasing polarity: You AnsweredN-O < N-N < N-F < H-FCorrect AnswerN-N < N-O < N-F < H-FH-F < N-F < N-O < N-NN-N < N-O < H-F < N-FN-N Which of the following elements has six valence electrons? BeBCCorrect! OOWhich molecule is most polar? S= C= SO= C= OCorrect! O= C= SThese all have the same polarity. O= C= STake enough money away from your bank account and the bank will show a negative credit. Take an electron away from an atom, however, and the atom shows up positive. Explain. Electrons are already negative. Therefore, we know from basic math that subtracting a negative (number) from a neutral (atom), will make the result positive. Correct! Neutral atoms contain identically charged but

oppositely signed protons and electrons. Removing one of the negative electrons results in an excess of positively charged protons. Removing an electron from an atom does not have the atom show up positive. It simply leaves the atom short one electron. Atoms are constantly exchanging electrons. Having an atom “ show up positive” is only an expression indicating that it has taken its turn in the game of electron exchange. neutral atoms contain identically charged but oppositely signed protons and electrons. Removing one of the negative electrons results in an excess of positively charged protons. Given that the total number of atoms on our planet remains fairly constant, how is it ever possible to deplete a natural resource such as a metal? The problem remains that not everyone recycles as they should. Recycling only forestalls the inevitable depletion of metal resources. You AnsweredThe atoms don’t leave our planet, which is why naturally occurring materials never really reach the point of depletion. Correct AnswerThe problem is with the expense of collecting metal atoms that are uniformly dispersed. the problem is with the expense of collecting metal atoms that are uniformly dispersedWhat is the molecular shape of the SF_2SF2molecule?

linearCorrect AnswerbentYou Answeredtetrahedraloctahedral

bentWhich of the following has the greatest number of nonbonding pairs of electrons? CHHeCorrect! FFHow many covalent bonds would the O atom usually form?

1Correct! 246

2Distinguish between a metal and a metal-containing compound. There is no distinction between the two. Correct! Only one of these contains ionic bonds. Only one of these contains covalent bonds. Only one of these occurs naturally. only one of these contains ionic bondsWhich of the following molecules would contain a dipole? Correct AnswerH-FYou AnsweredCl-ClH-HF-FH-FTwo liquids, A and B, have very different physical properties. A and B do not mix. A boils at 80°C and freezes at -30°C. B boils at 35°C and freezes at -100°C. Molecules of which are likely to have the largest dipole? Correct Answermolecule Amolecule BNot enough information was given. You AnsweredBoth have similar dipoles. molecule AAn individual carbon-oxygen bond is polar. Yet carbon dioxide is nonpolar because _____.(A) the molecule has an even number of electrons(B) it’s symmetryYou Answered(C) the electron-pulls of the two oxygen atoms are equal and oppositeCorrect AnswerB and CB and CThe principal source of an atom’s electronegativity is the _____. repulsive force occurring among electrons within the same shellrepulsive force occurring between electrons within neighboring shellsCorrect! effective nuclear chargethe kinetic energy electrons have orbiting the nucleuseffective nuclear chargeElectron dot structures are not so important for understanding _____. ionic bondsCorrect! metallic bondscovalent bondspolar covalent bondsmetallic bondsWhich would you expect to have a higher melting point: sodium chloride, NaCl, or cesium chloride, CsCl? Why? The cesium chloride has a higher melting point because larger ions of the same charge are able to attract more ions of the opposite charge. The cesium chloride has a higher melting point because its ions are smaller, which makes the charges more dense. The sodium chloride has a higher melting point because of the greater charges of the ions, and hence

the greater force of attractions between them. Correct! The sodium chloride has a higher melting point because its ions are smaller, which allows oppositely charged ions to get closer. the sodium chloride has a higher melting point because its ions are smaller which allows oppositely charged ions to get closerHow do the electron-dot structures of elements in the same group in the periodic table compare with one another? The structures differ by exactly two electrons between vertically consecutive elements. The number of valence shell electrons increases by one for each element from the top to the bottom of the group. Correct! Elements of the same group have the same number of valence electrons. The number of electrons in the electron-dot-structure will equal the group number for each element of the group. elements of the same group have the same number of valence electronsHow many chloride ions (Cl1-) are needed to balance the positive charge of a barium ion (Ba2+)? Correct! 21302Which of the following molecules contains an ionic bond? Correct! MgCl2Cl2SF3Cl2O7MgCl2Atoms of metallic elements can form ionic bonds, but they are not very good at forming covalent bonds. Why? These atoms are too large to be able to come in close contact with other atoms. Correct! They have a great tendency to lose electrons. Their valence shells are already filled with electrons. They are on the wrong side of the periodic table. they have a great tendency to lose electronsAmmonia is more polar than is borane because it _____. has a lone pair of electronsis less symmetrical than boraneits hydrogens are not exactly opposite one anotherCorrect! all of the aboveall of the aboveWhen is the electronic geometry of a molecule not the same as its molecular shape? Correct! when one or more of the substituents is a lone pair of electronswhen there are an odd number of electron pairs as substituentswhen there are an

odd number of electrons surrounding the central atomThe geometry of a molecule is always the same as its shapewhen one or more of the substituents is a lone pair of electronsHow many substituents are on the nitrogen atom in NH4+?

13You Answered5Correct Answer4

4What surrounds the sulfur atom in SF4? four substituent fluorine atomsCorrect! four substituent fluorine atoms plus one lone pair of electronsfour substituent fluorine atoms plus two lone pairs of electronsfour substituent fluorine atoms plus three lone pairs of electronsfour substituent fluorine atoms plus one lone pair of electronsWhat is the name for the following polyatomic ion?

CH3CO2-

triacetatemonocarboxylateCorrect! acetateacidic

acetateIf a neutral atom loses one electron, what is the electrical charge of the atom?-1Correct!+1-2+2+1What is the molecular shape of the ammonia molecule?

Correct! pyramidalbenttetrahedralT-shaped

pyramidalThe neon atom tends NOT to gain any additional electrons because _____. its nuclear charge is not great enoughthat would result in a positive ionof the repulsions they would experience with electrons in the same shellCorrect! there is no more room available in its outermost occupied shellthere is no more room available in its outermost occupied shellHow is it

possible for a neutral molecule, such as water, to form an ion? Correct! It can combine with a hydrogen ion to form a positively charged species. It can combine with a chloride ion to form a negatively charged species. It can fragment into protons and electrons. it can combine with a hydrogen ion to form a positively charged speciesHow many electrons are used to draw the electron-dot structure for hydrogen peroxide? 478Correct! 1414Which of the following molecules is most likely to show a hydrogen bonding interaction? Correct!(A) CH3OH(B) CH3SH(C) CH4(D) H-C-C-H(E) A, B and CCH3OHFluorine is a relatively _____. large atomsoft atomCorrect! small atomgreenish atomsmall atomFish don’t live very long in water that has just been boiled and brought back to room temperature. Suggest why. There is now a higher concentration of dissolved CO2 in the water. The nutrients in the water have been destroyed. Since some of the water was evaporated while boiling, the salts in the water are now more concentrated. This has a negative effect on the fish. Correct! The boiling process removes most of the air that was dissolved in the water. Upon cooling the water is void of its usual air content, hence, the fish drown. The boiling process removes most of the air that was dissolved in the water. Upon cooling the water is void of its usual air content, hence, the fish drown. If you need 3. 01 × 1023 molecules of sucrose, how many liters of a 4. 00 molar solution would you need? Correct! 0. 125 L0. 250 L4. 00 L1. 00 L0. 125LWhich of the following is most likely to have the weakest induced dipole-induced dipole interaction? Cl2Br2Correct! F2I2All of the above have the same interactions. F2Describe what usually happens to a hot solution that is saturated with a solid as it cools. The solid that is dissolved comes out of the solution completely. The solid stays in the solution. Correct! Some of the solid comes out of the solution. The solution

freezes. some of the solid comes out of the solutionWhich of the following would have the weakest induced dipole-induced dipole interactions? Correct! C6H14C8H18C10H22C12H26not enough information givenC6H14Red blood cells have a high concentration of dissolved ions. When placed into pure water they rupture. Why? Correct! Osmosis draws water into the cell until it pops. Water dissolves the cell membrane. Osmosis draws water out of the cell until it tears. The cells are not stable outside of a biological host. osmosis draws water into the cell until it popsCells at the top of a tree have a higher concentration of sugars than cells at the bottom. How might this fact assist a tree in moving water upward from its roots? Cells with high concentrations of sugar are more dense. As these cells migrate downwards, cells containing fresh water are able to migrate upwards. Correct! Water is pushed upwards by osmostic pressure. It doesn't. In fact, water makes it to the top of a tree because that is where the water molecules are being evaporated. Fresh water is drawn upwards to the sugar containing cells by way of dipole-dipole molecular interactions. water is pushed upwards by osmotic pressureWhich of the following is the strongest form of intermolecular attraction? a chemical bondCorrect! an ion-dipole interactiona dipole-dipole interactiona dipole-induced dipole interactionan induced dipole-induced dipole interactionan ion-dipole interactionHow many molecules of sucrose are in 0. 5 00L of a 2. 00 molar solution of sucrose? 3. 01 × 1023 molecules of sucroseCorrect! 6. 02 × 1023 molecules of sucrose12. 04 × 1023 molecules of sucrose1 gram6. 02 x 1023 molecules of sucroseWhat happens if you were to place a concentrated solution into a bag made of a semipermeable membrane and were to then suspend it in a very dilute solution? The size of the suspended bag would decrease. Correct! The size of the suspended bag would increase.

The size of the bag would not change. The solutions would eventually reach the same concentration. the size of the suspended bag would increaseWhich of the following would have the highest boiling point? Cl2Br2F2Correct! I2not enough information givenI2What is the main difference between a dipole-dipole interaction and a dipole-induced dipole interaction? Correct! Both are similar, but one involves a temporary dipole created by a permanent dipole. Dipole-dipole interactions are weaker because the dipoles are permanent. Dipole-induced dipole interactions are stronger because the induced dipoles can be formed at any time. Both are identical. both are similar but one involves a temporary dipole created by a permanent dipoleIf an ionic bond is stronger than a dipole-dipole interaction, how can water dissolve an ionic compound? Correct! The ion-dipole interactions of a bunch of water molecules gang up on the strong ionic bond and pull it into the solution. The ionic bond is weakened by the ion-dipole interactions and ionic repulsion ejects the ions from the crystal. The ion-dipole interaction causes the ions to heat up and vibrate free of the crystal. The ions never overcome their interatomic attraction and therefore are not soluble. the ion-dipole interactions of a bunch of water molecules gang up on the strong ionic bond and pull it into the solutionWhy are the melting temperatures of most ionic compounds far greater than the melting temperatures of most covalent compounds? Correct! Ionic bonds are so much stronger than the intermolecular attractions between covalently bonded compounds. Covalent bonds are not as strong as ionic bonds. As a solid, salts have a very organized crystalline structure which takes a lot of energy to break apart. Most covalent compounds have at least one weak bond in their structure that is easily broken when heat is added. ionic bonds are so much stronger

than the intermolecular attractions between covalently bonded compoundsHow can you tell whether a sugar solution is saturated or not? Add more sugar, if it dissolves, it is saturated. There will be a precipitate if the water is heated. As long as there are more water molecules than sugar molecules, there is a saturated solution. Correct! Add more sugar. If it does not dissolve after mixing, the solution is saturated. add more sugar if it does not dissolve after mixing the solution is saturatedWhat is a hydrogen bond? Correct! a special type of dipole-dipole attraction involving hydrogen bound to a highly electronegative atoma special type of dipole-dipole attraction involving hydrogen bound to any other atoma special type of dipole-dipole attraction involving hydrogen bound to another hydrogen atoma special type of attraction involving any molecules that contain hydrogensa special type of dipole-dipole attraction involving hydrogen bound to a highly electronegative atomWhy do red blood cells, which contain an aqueous solution of dissolved ions and minerals, burst when placed in fresh water? The dissolved ions provide a pressure that eventually bursts open the cell. Correct AnswerMore water molecules enter the cell than leave the cell. You AnsweredThe fresh water acts to dissolve the blood cell wall. all are correctmore water molecules enter the cell than leave the cellHard water contains excessive amounts of _____. chlorine ionsCorrect! calcium ionshydrogen ionshydroxide ionscalcium ionsHow is the solubility of a solid affected by temperature? As temperature goes up, the solubility goes up. As temperature goes down, the solubility goes down. As temperature goes up, the solubility goes down. As temperature goes down, the solubility goes up. Correct! It depends on the soliddepends on the solidWhich of the following accurately describes osmosis? Correct! The more concentrated solution

absorbs water from the less concentrated solution. The less concentrated solution absorbs water from the more concentrated solution. The less concentrated solution gets more dilute. The ions migrate from the more concentrated solution to the less concentrated. the more concentrated the solution absorbs water from the less concentrated solutionWould you expect to find more dissolved oxygen in polar or tropical ocean waters? Why?

There would be more dissolved oxygen in the tropical oceans because intense tropical storms mix up the atmospheric oxygen into the ocean water. There would be more dissolved oxygen in the polar oceans because the colder oxygen would “ sink” and dissolve into the water. There would be more dissolved oxygen in the tropical oceans because the heated oxygen molecules in the air would collide with and mix into the water.

Correct! There would be more dissolved oxygen in the polar oceans because the solubility of oxygen in water decreases with increasing temperature.

What is the difference between a dipole-dipole interaction and an ion-dipole interaction? one involves hydrogen bonding while the other does notone involves salts and water while the other doesn’t involve waterone involves ionic molecules interacting with other ionic molecules while the other deals with polar molecules

Correct! one involves dipole attraction between molecules while the other involves dipole interactions between molecules and ions

A dipole is a _____.

Correct! separation of chargesmolecule with parallel bondsnonpolar entityform of electronegativity

Hydrogen chloride, HCl, is a gas at room temperature. Would you expect this material to be very soluble or not very soluble in water?

Correct! HCl is very soluble in water by virtue of the dipole/dipole attractions occurring between the HCl and H2O molecules.

It is not very soluble because it is a gas, and all gases have very low solubility in water at room temperature. HCl is very soluble in water because it is such a small molecule, there is little electrical attraction to other HCl molecules. It is not very soluble because as a gas with low density, it floats to the surface of the water and then into the surrounding atmosphere.

An inventor claims to have developed a new perfume that lasts a long time because it doesn’t evaporate. Comment on this claim.

A perfume that does not evaporate could be toxic since the molecules never leave the skin.

Correct! In order to smell something, the molecules must evaporate and reach your nose. If the new perfume doesn’t evaporate, it will not have an odor. This would be impossible to make because the perfume would have to be pressurized in order to not evaporate. This product is sure to sweep the market making many happy customers.

How many grams of sugar (sucrose) are there in 5. 0 liters of sugar water that has a concentration of 0. 50 grams per liter of solution? 50 g25

gCorrect! 2. 5 g1. 5 gHow are intermolecular forces and solubility related? Correct! Solubility depends on the solvent’s ability to overcome the intermolecular forces in a solid. Solubility depends on the solute’s ability to overcome the intermolecular forces in the solvent. Solubility is a measure of how strong a solvent’s intermolecular forces are. Solubility is a measure of how weak the intermolecular forces in the solute are. Under which of the following conditions would you expect the highest solubility of oxygen gas in water? high temperature and low pressure above the solutionCorrect! low temperature and high pressure above the solutionlow temperature and low pressure above the solutionhigh temperature and high pressure above the solutionWhich of the following molecules is most likely to show a dipole-dipole interaction? Correct! CH3OHCH3SHCH4H-C-C-HA and BA soap molecule is _____. primarily polarprimarily nonpolarCorrect! a molecular with both a polar and nonpolar parta neutral compoundA sample of steel is composed of 5 percent carbon and 95 percent iron. Which is the solvent? Correct! ironcarbonsteelSteel is not a solution, it is a mixture. A solid cannot be a solvent. Which of the following molecules is most likely to show a dipole-dipole interaction? Correct! SO2CO2CH4H-C-C-HWhich of the following would have the highest boiling point? C6H14C8H18C10H22Correct! C12H26Why are ion-dipole attractions stronger than dipole-dipole attractions? The chemical bond in an ion-dipole molecule is similar also a covalent bond. Correct! The magnitude of the electric charge associated with an ion is much greater. Dipole areas are subject to changing from positive to negative regions on the molecule. Like charge (dipole) does not attract like charge (another dipole.)How many grams of sodium chloride are needed to make 15 L of a solution that has a concentration of 3. 0 g per liter of

solution? 30. g141 g5. 0 gCorrect! 45 gWhat is molarity? the number of grams of solute per liter of solutionYou Answeredthe number of moles of solute per liter of solventthe number of liters of solute per mole of solutionCorrect Answerthe number of moles of solute per liter of solutionWhen you set a pot of tap water on the stove to boil, you'll often see bubbles start to form well before boiling temperature is ever reached. Explain this observation. These are dissolved salts heating up and escaping from the water. These bubbles are formed as the surrounding gases from the air dissolve into the water as it is heated. They are very minute pockets of water in the gaseous phase. When they get large enough, the water will boil as this gas escapes. Correct! These initial bubbles are the gases that were dissolved in the water coming out of solution. The solubility of gases in water decreases with increasing temperature. Treating water with chlorine or ozone during water purification is an example of _____. a physical changeCorrect! a chemical reactionion exchangea solid dissolving in a liquidWhich of the following molecules would you expect to be the most strongly attracted to a Cl- ion? Correct! H-FH3C-CH3Cl-ClF-FCCl4Which of the following solutions is the most concentrated? one liter of water with 1 gram of sugarone liter of water with 2 grams of sugarone liter of water with 5 grams of sugarCorrect! one liter of water with 10 grams of sugarIf the solubility of a compound is 72 grams per liter at a given temperature, how many grams of the compound will dissolve in 0. 50 liters at the same temperature? Correct! 36 g72 g144 g30 gWhy might a solvent like turpentine be better for removing grease and grime than water? Like dissolves like. Oil and grease have similar interatomic forces as the turpentine and so are more soluble. Water is too polar and doesn't interact

well with the nonpolar oils. Oil and grease have very limited solubility in the water. Correct! all of the aboveHow many molecules of sucrose are in 0. 500 L of a 1. 00 molar solution of sucrose? Correct! 3. 01 × 1023 molecules of sucrose6. 02 × 1023 molecules of sucrose12. 04 × 1023 molecules of sucrose0. 5In which of the following molecules will water induce a temporary dipole? CO2O2N2Correct! all of themnone of themA 1 molar solution of sucrose (Formula Weight 342. 6 g/mol) solution contains _____. 1 mole of sucrose342. 6 g of sucrose6. 02: times10^{23} molecules of sucroseCorrect! all are correctDoes a plastic bottle of fresh water sink or float in the ocean? Why? Sinks; The combined density of the plastic bottle plus the fresh water inside is greater than the density of the ocean water. Correct! Floats; The bottle filled with fresh water floats in ocean water because it is less dense than the ocean water. Floats then sinks; The bottle filled with fresh water floats in ocean water until the fresh water reaches the same temperature as the ocean water, at which point it sinks. Sinks slightly; The added density of the plastic bottle will cause the bottle to sink slightly. It would most likely sink less than a foot where the density of the ocean water would be equal to or greater than the bottle of fresh water. A solid has a solubility at room temperature of 78 grams per liter. If 1. 0 L of a heated solution containing 100. g of solute is cooled to room temperature, how much solid is formed? 100 gCorrect! 22 g78 g1 L22 gIn a solution made from one teaspoon of sugar and one liter of water, which is the solute? waterCorrect! sugarboth sugar and waternone of the abovesugarWhich of these statements about boiling point is incorrect?

I. Boiling occurs when sufficient molecular energy to convert a liquid to a gas. II. The stronger the cohesive forces the higher the boiling point. III. Boiling results in the cleavage of chemical bonds. I onlyII onlyCorrect! III onlyI and IIIII and III

The stronger the cohesive forces in a substanceCorrect! the higher the boiling point and the melting point. the lower the boiling point and higher the melting point. the lower the boiling point and the melting point. the higher the boiling point the lower the melting point. Boiling and melting point are independent of forces. Which of these is not a unique property of water?

I. expands when it freezesII. nonpolar moleculesIII. a good solventI onlyI and IIICorrect! II onlyII and IIIIII only

The rise of a liquid up a narrow test tube is due toCorrect! capillary action: an interplay of both cohesive and adhesive forcescohesive forces onlyadhesive forces onlyionic forcesThe amount of heat energy required to change a solid to a liquid is known as: heat of changeheat of vaporizationCorrect! heat of meltingheat of sublimationWhich of the following statements are true concerning water:

(i) ice is less dense than liquid water

(ii) adhesive forces are responsible for attraction between water molecules and different substances

(iii)water beads form due to surface tension

(iv) condensation is a warming process while evaporation is a cooling process

Correct!(A) i, ii, iii and iv(B) ONLY ii and iii(C) ONLY i(D) None of the statements are true

Which of these substances would have the weakest cohesive forces in combination with extremely high molecular mobility? H2O(l)Correct! CH4(g)KCl(s)N2(l)Au(s)Which of these substances would have the strongest cohesive forces in combination with the greatest molecular mobility? Correct! H2O(l)CH4(g)KCl(s)O2(g)Au(s)Which of these substances would you expect to have the lowest boiling point? diamondgraphite(pencil lead)waterCorrect! pentaneleadSurface tension in water is a result of: Correct! hydrogen bondsionic bondsLondon dispersion forcesnone of the aboveWhich of these substances, existing as a liquid, contains hydrogen bonds?

I. NH3II. H2OIII. C2H5OHIV. CH 3CH3I onlyII, III and IVI and IIII and IIICorrect! I, II and III

Which of these describes the process by which a liquid molecule at the surface of a liquid escapes to the gas phase? meltingsublimationCorrect! evaporationdepositioncondensationWhich of these statements about liquids is correct?

I. Increased molecular motion will result increased rate of evaporation. II. Liquids will take the shape of their container. III. Liquids have relatively low compressibility. I onlyII onlyI and IIII and IIICorrect! I, II and III

Which of these correctly describes solids with a well-ordered structure? cohesiveCorrect! crystallineamorphousneatcompressedWhy do ponds not freeze from the bottom up, i. e, fish and other living organisms survive winter by living beneath the frozen crust of a lake: water does freeze from the top up; all fish must migrate to warmer waters during winterthe kinetic energy of water is high enough to keep it from completely freezingthe body heat from the fish keep the water from freezingCorrect! below 4C, the surface water cools to below 4C, becomes less dense than the water below it and therefore doesn't sinkWhich of the following statements is not true as regards the specific heat of water:

(i) water has a higher specific heat than iron

(ii) water has a high specific heat because much of the heat added to water is consumed in breaking hydrogen bonds

(iii) water has a high specific heat because much of the heat applied to water is converted to kinetic energy

(iv) water has a high specific heat because much of the heat applied to water is converted to potential energy

(A) i(B) iiCorrect!(C) iii(D) i and iv

Which of these factors will not affect the melting point of a substance? cohesive forcestemperaturemolecular motionmolecular structureCorrect! All of these will affect the melting point. Which of these is a benefit of waters unique freezing properties? Correct! Water insulates lakes which freeze on the surface in the winter. Icebergs sink to the bottom of the ocean cooling

volcanic eruptions. Water is so small that it contributes little to erosion. Freezing of cells allows for extended preservation of the cells. Flash freezing results in the destruction of a food sample. Which of these statements about water is incorrect? Water has a high boiling point. Water expands when it freezes. Water is the most abundant liquid on the planet. Water molecules hydrogen bond with other water molecules. Correct! All of these are correct statements. Which of these statements about cohesive forces are correct?

I. In the absence of cohesive forces, most substances would be solids. II. Cohesive forces result in the formation of liquid droplets or spheres. III. A spherical shape minimizes surface-area to volume ratio. I onlyII onlyI and IIICorrect! II and IIII and II

Which of the statements about solids are correct?

I. Solids have lower kinetic energy than liquids. II. Molecules within solids are completely motionless. III. The shape of a solid is independent of the container which holds it. I onlyII onlyI and IIII and IIICorrect! I and III

Which of the statements about liquids is incorrect? Liquids are highly disordered when compared with solids. Liquids have high molecular motion when compared with solids. Correct! Liquids have a relatively fixed shape when compared with solids. Liquids have strong molecular attractions when compared with gases. Liquids have a relatively low compressibility when compared with gases. The point at which a liquid is converted to a gas is known as the ____. Correct! boiling pointmelting pointsublimation pointdeposition pointfreezing pointIce floats in water becauseCorrect! hydrogen bonds hold the water molecules in the ice in an open crystalline

structure that makes it less dense than wateras more ice forms, its weight increases the density of the waterkinetic energy of the ice is greater than that of waternone of the aboveSubstance A contains stronger cohesive forces than substance B. Which is true? Substance A will have a higher boiling point and higher vapor pressure than substance B. Substance A will have a lower boiling point and lower vapor pressure than substance B. Substance A will have a lower boiling point and higher vapor pressure than substance B. Correct! Substance A will have a higher boiling point and lower vapor pressure than substance B. Can’t tell from the given information. How many moles of oxygen gas are needed to react with 9 moles of acetylene, C2H2?

2C2H2 + 5O2(g) ? 4CO2 + 2H2O

You Answered0. 4 moles4. 5 moles9 moles18 molesCorrect Answer22. 5 moles

Metals tend to ____ electrons and form ions with a ____ charge? Correct! lose, positivelose, negativegain, positivegain, negativelose , zeroFor an ionic compound, X2Y5, if the charge on each Y ion is ? 2, the charge on each X ion is:? 2? 5? 10+10Correct!+5How many moles of calcium atoms are 2. 5 moles of calcium carbonate, CaCO3? 1 mole1. 25 molesCorrect Answer2. 5 molesYou Answered5. 0 moles100 molesHow many grams of carbon dioxide are produced when 18. 5 moles of oxygen react with acetylene,

2C2H2 + 5O2(g) ? 4CO2 + 2H2OYou Answered2, 035 grams814 gramsCorrect Answer651 grams88 grams37 grams

Which of these substances is a compound? airsalt watergasolineCorrect! saltlemonadeNicotine has the chemical formula C10H14N2. What is the molecular weight of nicotine? 26 amu81 amu138 amuCorrect! 162 amu366 amuHow many grams of methanol (CH3OH) are produced when 5. 00 kg of H2 reacts with excess carbon monoxide?

CO + 2H2 ? CH3OH40 gYou Answered80 g320 g640 gCorrect Answer40, 000 g

Which of these is an ionic compound? NCl3Correct! Li2OPF5CH4I2How many moles of carbon are atoms are in 1. 574 g of novocain, C13H21N2O2Cl? 0. 01008 moles0. 005776 molesCorrect! 0. 07510 moles0. 12096 moles0. 006148 molesWhich statement about ionic compounds is incorrect? Ionic compounds contain nondirectional bonds. Ionic solids dissolved in water will conduct electricity. Ionic bonds are formed between metals and nonmetals. Correct! Ionic bonds involve the sharing of electrons by metals and nonmetals. Ionic compounds are held together by attraction between positive and negative ions. How many grams of nitrogen dioxide are required to produce 260 grams of nitrogenmonoxide?

3NO2 + H2O ? 2HNO3 + NO8. 67 gramsYou Answered56. 52 grams132 grams399 gramsCorrect Answer1196 grams

Which of these is the correct formula for aluminum oxide? Al2O2Correct! Al2O3AlOAl3O2AlO2Which is of these is the correct chemical formula for carbon tetrachloride? CCl3Correct! CCl4CCl5C4ClNone of the aboveWhich of the following does not contain the same number of chlorine atoms as 60 CCl4 molecules? 240 HCl molecules120 chlorine moleculesYou Answered40

SCl6 molecules80 CFCl3 moleculesCorrect Answer60 CHCl3 moleculesUsing the old English measurements of volume listed, determine the number of gallons in two gills.

1 gill = 1 noggin 1 butt = 2 hogsheads1 kilderkin = 2 firkins 1 firkin = 9 gallons1 hogshead = 52. 458 gallons 1 peck = 64 noggins1 peck = 2 gallons

0. 0039 gallons64 gallonsCorrect! 0. 0625 gallons512 gallons2304 gallons

How many grams of water are produced when 10. 0 grams of O2 react with excess H2?

2H2 + O2(g) ? 2H2OCorrect! 11. 25 grams20 grams46 grams180 grams360 grams

Which of these is the correct formula for potassium phosphate? KPO4Correct! K3PO4K(PO4)3K2(PO4)3K3PUsing the old English measurements of volume listed, determine the number of hogsheads in five kilderkins.

1 gill = 1 noggin 1 butt = 2 hogsheads1 kilderkin = 2 firkins 1 firkin = 9 gallons1 hogshead = 52. 458 gallons 1 peck = 64 noggins1 peck = 2 gallonsCorrect Answer1. 72 hogsheads2. 91 hogsheadsYou Answered90 hogsheads4, 721 hogsheads42, 489 hogsheads

Which of these is the correct name for NaHCO3? sodium carbonatesodium trioxidesodium monocarbideCorrect! sodium bicarbonatesodium carbide oxideWhich of these statements about covalent compounds is incorrect? You AnsweredCovalent bonds involve the combination of two nonmetals. Correct

AnswerCovalent compounds dissolve in water to form electrolyte solutions. Covalent compounds contain atoms which share electrons to gain stability. The bonds in covalent compound are often oriented in a particular direction. Electrons in covalent compounds are not always equally shared between atoms. What is the molecular weight of PCl3? 66. 5 amu106. 5 amuCorrect Answer137. 5 amuYou Answered180 amu360 amuWhich of these will not form a positive ion in an ionic compound? You AnsweredBaRbCorrect AnswerPSnMgDetermine the number of moles in a 1. 95 × 10? 2 gram sample of the amino acid glycine, CH2(NH2)CO2H. Correct Answer2. 6 × 10? 4 moles2. 6 × 10? 2 moles1. 46 molesYou Answered2. 0 × 10? 2 moles3. 85 × 10? 1 molesWhich of these is the correct SUM of the coefficients when the equation is balanced?

__ CaCl2(aq) + __ K2CO3(aq) ? __ KCl(aq) + __ CaCO3(s)24Correct! 5810

How many grams of gallium are there in a 145 gram sample of gallium arenside, GaAs? 74. 9 gCorrect! 69. 7 g145 g6. 02 × 1023 gWhy is it important for a chemist to know the relative masses of atoms? You AnsweredThere are not that many different kinds of atoms and so it’s important to know how they relate to one another. Correct AnswerIt provides information about how many atoms two samples have relative to each otherIt provides an indication of how the different atoms will interactBecause the mass of an atom is directly related to its chemical properties. Which of the following has the greatest mass? Correct Answer1 mole of Pb1 mole of H2You Answered1 mole of Be1 mole of NaAll have the same mass. How many grams of water can be formed from the reaction between 10 grams of oxygen and 1 gram of hydrogen? You Answered11 grams of water are

formed since mass must be conserved. 10 grams of water are formed since you can't get a greater mass of water produced than oxygen reacting. Correct Answer9 grams of water are formed because oxygen and hydrogen react in an 8: 1 ratio. No water is formed because there is insufficient hydrogen to react with the oxygen. The _____ is what needs to be overcome in a reaction so that it can proceed to the products. bond energycatalystentropythermodynamicsCorrect! activation energyAssume air has an average molar mass of 28 grams/mole, and determine how many moles of air molecules there are 1. 0 liters of air, which contains 1. 26 grams of air molecules. 28 moles0. 45 moleCorrect! 0. 045 mole22. 4 molesAccording to the following balanced chemical equation, if you want to generate two moles of H2O how many grams of O2 do you need?

2 H2 + O2 ? 2 H2OCorrect! 3216846. 022 × 1023

If it takes 20 beryllium atoms to equal the mass of two krypton atoms, what is the relative mass of beryllium compared to krypton? Correct! 1/101/2040 times100 times10 timesEntropy is a measure of _____. disorderCorrect Answerthe spreading of energysolar energyYou AnsweredthermodynamicsGiven the following generic chemical reaction, which is correct

X ? YX is the product. Correct! Y is the product.? is the product. Both X and Y are the products. Both X and Y are the reactants.

Given that the bond energy of N2 is 946 kJ/mole, the bond energy of O2 is 498 kJ/mole and the NO bond energy is 631 kJ/mole, how much energy is

required to react 1 mole of nitrogen molecules according to the following reaction?

N2 + O2 ? 2 NOCorrect! 182 kJ-182 kJ813 kJ-813 kJ

How many moles of water, H2O, are produced from the reaction of 16 grams methane, CH4, with an unlimited supply of oxygen, O2. How many grams of water is this?

CH4 + 2H 2 O? CO2 + 2 H2O0. 889 mole, which is 16 grams2. 0 moles of water, which is 32 gramsCorrect! 2. 0 moles of water, which is 36 grams1. 0 mole of water, which is 18 grams

Balance the following equation.

____ NO ? ____ N2O + ____ NO2Correct! 3, 1, 13, 0, 04, 4, 81, 2, 46, 2, 1

Ozone, O3, is _____. a pollutanta naturally occurring compoundan elemental materialCorrect! all of the aboveWhy might increasing the concentration of a set of reactants increase the rate of reaction? Correct AnswerYou have increased the chances that any two reactant molecules will collide and react. You have increased the ratio of reactants to products. You AnsweredThe concentration of reactants is unrelated to the rate of reaction. The rate of reaction depends only on the mass of the atoms and therefore increases as you increase the mass of the reactants. none of the aboveFor the following balanced reaction, which of the following is a gas?

2 Na(l) + Cl2(g) ? 2 NaCl(s)NaCorrect AnswerCl2ClYou AnsweredNaCl

What is the formula mass of a molecule of c6h12o6? Correct Answer180 amu24 amu29 amuYou Answered168 amuWhat is the mass of one mole of H2? Correct Answer2 g1 g20 gYou Answered6. 022 × 1023 gThere are 1000 liters in 1 cubic meter and 1000 grams in 1 kilogram. How many grams of air are there in 0. 01liter of air? (Assume a density of 1. 25 kg/L.)0. 00125 gram0. 125 gramYou Answered1. 25 gramsCorrect Answer12. 5 gramsIf it takes energy to break bonds and you gain energy in the formation of bonds, how can some reactions be exothermic while others are endothermic? Correct! It is the total amount of energy that matters. Sometimes some bonds are stronger than others and so you gain or lose energy when you form them. It is the total number of bonds that matters. Sometimes you create more bonds than you break and since all bonds have same amount of energy you gain or lose energy depending on the number of bonds. Some reactants have more energetic bonds than others and they will always release energy. Some products have more energy than others and they always require energy to be formed. In a chemical reaction, the bonds being formed are _____. the same as the ones brokenCorrect! different from the ones brokenmore energetic than the ones brokenless energetic than the ones brokenIn a chemical equation the coefficients _____. of the reactants should always sum up to those of the productsappear as subscriptsCorrect! appear before the chemical formulasTwo of the above are correct. What is the number of moles of H2O produced if you combust one mole of CH4 according to the following balanced equation?

CH4 + 2 O2 ? CO2 + 2 H2O8 moles6 moles4 molesCorrect! 2 moles

If it takes three golf balls to equal the mass of one tennis ball, what mass of tennis balls do you need to equal the number of golf balls in one kilogram of golf balls? Correct! 1/3 of a kg30 kg1 kg3 kgHow many grams of water, H2O, can be produced by the reaction of 8 grams of oxygen, O2, and 8 grams of hydrogen, H2? 16 grams10 gramsCorrect! 9 grams8 gramsAn international group of zookeepers with successful breeding programs made the following animal exchanges last year. Using the same bartering system, how many anteaters can a zoo obtain in exchange for 4 oryxes?

3 oryxes = 1 tiger 2 flamingos = 1 anteater1 camel = 6 anteaters 5 lemurs = 1 rhino1 rhino = 4 monkeys 3 lemurs = 1 camel3 monkeys = 1 tiger 1 rhino = 4 oryxes6 anteatersCorrect! 10 anteaters15 anteaters20 anteaters30 anteaters

A tiny crystal of sodium chloride contains 5, 000, 000 sodium ions and 5, 000, 000 chloride ions. The correct formula for sodium chloride is: Correct! NaClNa5Cl5Na50Cl50It could be any of the above. None of the aboveWhich of these is an ionic compound? Correct! AlCl3H2OSiO2IBrS8When properly balanced, what are the correct coefficients for the reaction : H2 + O2 ? H20 ? 1, 1, 11, 1/2, 11, 2, 1Correct! 2, 1, 210, 5, 10Using the old English measurements of volume listed, determine the number of noggins in one butt.

1 gill = 1 noggin 1 butt = 2 hogsheads1 kilderkin = 2 firkins 1 firkin = 9 gallons1 hogshead = 52. 458 gallons 1 peck = 64 noggins1 peck = 2 gallons104. 92 noggins128. 00 noggins209. 83 noggins1678. 7 nogginsCorrect! 3357. 3 noggins

Which of these is the correct SUM of the coefficients when the equation is balanced?

__ CaCl2(aq) + __ K2CO3(aq) ? __ KCl(aq) + __ CaCO3(s)24Correct! 5810

How many moles of oxygen gas will react with 6. 2 moles of aluminum?

4Al(s) + 3O2(g) ? 2Al2O3(s)0. 12 moles1. 55 moles2. 4 molesCorrect! 4. 65 moles8. 27 moles

Which of these is not a covalent compound? H2OTeCl4XeF4C2H2Correct! AlCl3What is the coefficient in front of oxygen (O2) when the equation is balanced?

__ C3H8 + __ O2 ? __ CO2 + __ H2O234Correct! 510

Which of these is the correct formula for potassium phosphate? KPO4Correct! K3PO4K(PO4)3K2(PO4)3K3PAutomotive air bags inflate when a sample of NaN3 (molar mass = 65 g/mol) is rapidly decomposed. What mass of NaN3 is required to produce 368 L of nitrogen gas (molar mass = 28 g/mol) with a density of 1. 25 g/L?

2NaN3(s) ? 2Na(s) + 3N2(g)228 gCorrect Answer712 g1709 gYou Answered2136 g3203 g

Barium fluoride is often used in glass manufacturing. Which of these is the correct formula and bonding type for barium fluoride? BaF, ionicBaF, covalentCorrect! BaF2, ionicBaF2, covalentBa2F, ionicWhich of these is the correct name for Ca(OH)2? calcium carbonatecalcium oxidecalcium dihydridecalcium oxygen hydrideCorrect! calcium hydroxideHow many

hydrogen atoms are in 25. 6 grams of sucrose, (C12H22O11)? 1. 647 atoms2. 6 × 1023 atoms4. 51 × 1022 atoms6. 02 × 1023 atomsCorrect! 9. 92 × 1023 atomsWhat is the coefficient in front of HF when the equation is balanced?

__ B2O3 + __ HF ? __ BF3 + __ H2O1235Correct! 6

How many moles of calcium atoms are 2. 5 moles of calcium carbonate, CaCO3? 1 mole1. 25 molesCorrect! 2. 5 moles5. 0 moles100 molesHow many grams are in 2. 35 moles of calcium carbonate, CaCO3? 0. 01175 grams0. 0235 grams0. 0588 grams107 gramsCorrect! 235 gramsAn international group of zookeepers with successful breeding programs made the following animal exchanges last year. Using the same bartering system, how many monkeys can a zoo obtain in exchange for 10 camels?

3 oryxes = 1 tiger2 flamingos = 1 anteater1 camel = 6 anteaters 5 lemurs = 1 rhino1 rhino = 4 monkeys 3 lemurs = 1 camel3 monkeys = 1 tiger 1 rhino = 4 oryxes6 monkeys12 monkeys15 monkeysCorrect! 24 monkeys30 monkeys

What is the molecular weight of PCl3? 66. 5 amu106. 5 amuCorrect! 137. 5 amu180 amu360 amuWhat is the molecular weight of cholesterol, C27H46O? 194 amu208 amu224 amu180 amuCorrect! 386 amuAre the chemical reactions that take place in a disposable battery exothermic or endothermic? Is the reaction going on in a rechargeable battery while it is recharging exothermic or endothermic? An operating disposable battery is driven by endothermic reaction, while a recharging rechargeable battery is also driven by endothermic reactions. Correct! An operating disposable battery is driven

by exothermic reaction, while a recharging rechargeable battery is driven by endothermic reactions. An operating disposable battery is driven by endothermic reaction, while a recharging rechargeable battery is driven by exothermic reactions. An operating disposable battery is driven by exothermic reaction, while a recharging rechargeable battery is also driven by exothermic reactions. What is the number of grams of CO2 produced if you combust 0. 50 mole of CH4 according to the following balanced equation?

CH4 + 2 O2 ? CO2 + 2 H2OCorrect! 22 g10 g44 g32 g

A friend argues that if mass were really conserved he would never need to refill his gas tank. What explanation do you offer your friend? The atoms (mass) of gasoline are converted into energy by the engine according to E = mc^2 ,!. The Law of Conservation of Mass does not apply to reactions involving combustion or explosion of matter. Correct! The atoms (mass) of gasoline are converted into exhaust fumes. The oil companies make gasoline in a way that it gets used up so that we are always required to replenish it. How does a catalyst increase the rate of a reaction? Correct! It lowers the activation energy. It is neither created nor consumed in a reaction. It has nothing to do with the rate of reaction. It increases the energy difference between the reactants and products. Which has more atoms: 64. 058 g of sulfur dioxide, SO2 (64. 058 amu), or 72. 922 g of hydrogen chloride, HCl (36. 461 amu)? 64. 058 g of SO2 has more atoms than 72. 922 g of HClCorrect! 72. 922 g of HCl has more atoms than 64. 058 g of SO272. 922 g of HCl and 64. 058 g of SO2 have about the same number atoms. Not enough information is given. If it takes three carbon atoms to equal the mass

of one chlorine atom, what mass of chlorine do you need to equal the number of atoms in one kilogram of carbon? Correct! 1/3 of a kg30 kg1 kg3 kg6 kgAnswer: ADiff: 1Learning Obj: 9. 2Global Obj: G-4What is an exothermic reaction? It is a reaction that requires heat as a reactant. It is a reaction where the products have more energy than the reactants. It is a reaction where there is a net adsorption of energy from a reaction. all of the aboveCorrect! none of the aboveAccording to the following balanced chemical equation, if you want to generate two moles of H2O, how many moles of O2 do you need?

2 H2 + O2 ? 2 H2OCorrect Answer121/24You Answered6. 022 × 1023

What is the formula mass of a molecule of CO2? Correct! 44 amu56 amu58. 9 amu118 amuWhat is the formula mass of a molecule of C6H12O6? Correct! 180 amu24 amu29 amu168 amuWhich of the following has the greatest number of particles? 1 mole of Na22. 990 g of Na1 mole of Be9. 012 g of BeCorrect! All are the same. Why might increasing the temperature alter the rate of a chemical reaction? Correct AnswerThe molecules will have a higher kinetic energy and bump into one another harder. You AnsweredThe molecules are less reactive at higher temperatures. The molecules will more likely combine with other atoms at high temperature to save space. The density decreases as a function of temperature and this leads to an increase in volume which drops the rate of reaction. none of the aboveHow many grams of water, H2O, can be produced by the reaction of 8 grams of oxygen, O2, and 8 grams of hydrogen, H2? 16 grams10 gramsCorrect! 9 grams8 gramsWhat is the mass of an oxygen atom, O, in atomic mass units? 12 amuCorrect! 16 amu18 amu32 amuHow many grams of water, H2O, can be

produced from the reaction of 25. 0 grams of hydrogen, H2, and 225 grams of oxygen, O2? You Answered250 gramsCorrect Answer225 grams200 grams25 gramsWhy is heat often added to chemical reactions performed in the laboratory? to allow a greater number of reactants to pass over the activation energyto increase the rate at which reactant collideto compensate for the natural tendency of energy to disperseCorrect! all of the aboveWhich of the following is a correctly balanced equation? Correct! P4 + 6 H2 ? 4 PH31 P4 + 6 H2 ? 4 PH30 P4 + 6 H2 ? 4 PH3P4 + 12 H2 ? 8 PH3P4 + 3 H2 ? PH3What is the mass of one mole of H2? Correct! 2 g1 g20 g6. 022 × 1023 gSeven grams of nitrogen, N2, (N, atomic mass 14 amu) contains _____. 1 mole of nitrogen atomsCorrect! 0. 5 moles of nitrogen atoms0. 25 moles of nitrogen atomsNot enough information is givenWhich of these is the correct name for MgCl2? Correct! magnesium chloridemagnesium chlorinemagnesium trichloridemagnesium monochlorinemonomagnesium trichlorideWhich of these is the correct name for Li2SO4? lithium sulfidedilithium sulfidedilithium sulfateCorrect! lithium sulfatedilithium tetrasulfideWhich of these is the correct name for Ca(OH)2? calcium carbonatecalcium oxidecalcium dihydridecalcium oxygen hydrideCorrect! calcium hydroxideMetals tend to ____ electrons and form ions with a ____ charge? Correct! lose, positivelose, negativegain, positivegain, negativelose , zeroWhich of these is the correct formula for aluminum oxide? Al2O2Correct! Al2O3AlOAl3O2AlO2How many grams of methanol (CH3OH) are produced when 5. 00 kg of H2 reacts with excess carbon monoxide?

CO + 2H2 ? CH3OH40 g80 g320 g640 gCorrect! 40, 000 g

Calculate the number of oxygen atoms in 45. 0 g of Co2(SO4)3 (molar mass = 405. 8 g/mole). Correct! 8. 01 × 1023 atoms2. 67 × 1023 atoms12. 0 atoms6. 68 × 1022 atoms1. 07 × 1024 atomsWhy is the equation incorrect?

Mg3 + N2 ? Mg3N2The equation is not balanced. The coefficient of N2 is incorrect. The valence of the nitride ion is incorrect. Correct! Some of the subscripts are incorrectly used. The valance of the magnesium ion is incorrect.

How many moles carbon atoms are in 5 moles of ethanol, CH3CH2OH? 2. 5 mole5 molesCorrect! 10 moles30 moles120 molesHow many moles of oxygen atoms are in a 0. 6163 grams of niacin, C6H5NO2? 5. 14 × 10? 2 moles3. 00 × 10? 2 molesCorrect! 1. 00 × 10? 2 moles5. 01 × 10? 3 moles8. 56 × 10? 3 molesWhich of the following does not contain the same number of chlorine atoms as 60 CCl4 molecules? 240 HCl molecules120 chlorine molecules40 SCl6 molecules80 CFCl3 moleculesCorrect! 60 CHCl3 moleculesHow many moles hydrogen atoms are in 3 moles of codeine, C18H21NO3? 3 mole21 moles36 moles54 molesCorrect! 63 molesNonmetals tend to ____ electrons and form ions with a ____ charge? lose, positivelose, negativegain, positiveCorrect! gain, negativelose , zeroUsing the old English measurements of volume listed, determine the number of hogsheads in five kilderkins.

1 gill = 1 noggin 1 butt = 2 hogsheads1 kilderkin = 2 firkins 1 firkin = 9 gallons1 hogshead = 52. 458 gallons 1 peck = 64 noggins1 peck = 2 gallonsCorrect! 1. 72 hogsheads2. 91 hogsheads90 hogsheads4, 721 hogsheads42, 489 hogsheads

Which is of these is the correct ratio of sulfur to oxygen in SO2? Correct! 1 sulfur: 2 oxygen2 sulfur: 1 oxygen2 sulfur: 2 oxygen2 sulfur: 3 oxygen1 sulfur: 3 oxygenWhich of these substances is a compound? NaYou AnsweredCl2PbCorrect AnswerNOH2How many moles of caffeine are in 1. 250 kg sample, C8H10N4O2? 6. 4 × 10? 6 moles0. 006 moles0. 008 molesCorrect! 6. 44 moles8. 56 molesWhat is the number of molecules of O2 consumed if you combust one mole of CH4 according to the following balanced equation?

CH4 + 2 O2 ? CO2 + 2 H2O1 molecule2 molecules6. 022 × 1023 moleculesCorrect! 1. 204 × 1024 molecules

Given that the bond energy of N2 is 946 kJ/mole, the bond energy of O2 is 498 kJ/mole and the NO bond energy is 631 kJ/mole, how much energy is required to react 1 mole of nitrogen molecules according to the following reaction?

N2 + O2 ? 2 NOCorrect Answer182 kJ-182 kJYou Answered813 kJ-813 kJ

What is an endothermic reaction? It is a reaction that requires heat as a reactant. It is a reaction where the products have more energy than the reactants. It is a reaction where there is a net adsorption of energy from a reaction. Correct! all of the aboveHow does a catalyst increase the rate of a reaction? Correct! It lowers the activation energy. It is neither created nor consumed in a reaction. It has nothing to do with the rate of reaction. It increases the energy difference between the reactants and products. How many grams of water can be formed from the reaction between 10 grams of

oxygen and 1 gram of hydrogen? 11 grams of water are formed since mass must be conserved. 10 grams of water are formed since