Acs general chemistry study guide 2019

Chemistry is the science of a substance and the changes it undergoes during chemical reactions. In this section, learn about the daily chemistry, from chlorine to beach helium, and even why chocolate turns gray. Give Honor & Memorial Sign Up For Post Cancer A-Z Stay Healthy Treatment & Support News Our Research participate in our partners about us Search for an independent, reliable guide to online education over 23 years! Copyright ©2021 GetEducated.com; Approved Colleges, LLC All Rights Reserved Getty Images/Getty Images News/Getty Images Study Chemistry is an integral study in pharmacy, as pharmaceutical research studies how different drugs respond chemically to chemicals inside the human body. Life itself can be summed up as the total amount of chemical reactions in the body. Pharmaceutical substances are intended to control or otherwise modify their reactions. Pharmacists are experts in dosage and related subjects, while pharmaceutical research studies chemistry. Pharmaceutical compounds are only effective to the extent that they affect targeted chemicals in the body, but rarely affect only one. These side effects are almost never beneficial. As such, the compounds used in the drugs are strictly controlled by their composition and their quantity. Each medication and condition is designed to have a specific concentration of compounds in the body, so doses must be checked. In general, doses affect the severity of the condition they treat and the body size of the person to whom they are administered. The chemistry of complex organisms such as humans is so complex that scientists only understand it very partially. Although pharmaceutical compounds must undergo several rounds of tests before release, unexpected effects are often detected long after the release of the drug. Learning chemistry can be stressful and feel overwhelming. There is no magic formula for learning chemistry, but you can develop an effective strategy for success. Whether you're in middle school, high school or college, these simple steps get you on the right track. Basically, it means not getting off by doing your job, and not psycheing yourself out: Don't procrastinate! Cramming doesn't equal learning. If you wait until the night before the test to start learning you will suffer, your grades will suffer, etc. Chemical problems will take time to work. Chemistry concepts take time to master. Don't procrastinate it's worth repeating! In chemistry, you build from one concept to another. A solid knowledge base is needed to succeed. Try Flash CardsHei, they are used in primary and primary school because FLASHCARDS WORK. Some of the information is learned during the preparation of cards and the rest can be learned during practice. You can switch between topics that are something on most laptops Offer. Get some index cards and give it a try! Try HighlighterUse it sensibly. The goal is not to make your book or notes fluorescent. Most texts already have important definitions in bold type. If your teacher is highly unusual, he almost always mention likely test questions, answers and concepts. Bring them out! Some teachers take questions from the test bank, but those who write themselves usually keep the spiritual concept during teaching. Use MnemonicsWhat you do here is having the first words in a jam you are trying to remember and make a phrase from them to earn memory help. Example: a series of the first few elements of periodic table H, He, Li, Be, B, C, N, O, F, Ne could be (well, the one that came to me was actually dirty, which is easier to remember) Hi Henry, Lookin'Big, Bad, Definitely Nasty, Old Friend - Not! Okay, that's not good literature. One popular mnemonic device has metric prefixes: Kilo-Hecto-Deca-Meter (liter, gram) deci-centi-milli-Kangaroos Hopping Down Mountains Drinking Chocolate Milk. It's even easier to remember phrases like this when you put them in music. Work Problems You work through an example problem in a book or class just fine. Great! This does not mean that you understand how to apply formulas when conditions or wording change. It is vital to solve problems. I know it seems like a good idea to share the problem with a set of classmates or put answers behind the book if you're short on time, but you really need to work on these problems to practice the skills you need in tests and beyond. You know your text, do you have a dictionary? The answers behind the problems? Self-viking? You add up full of useful information? Find out sooner rather than later. Look around the text. Use the dictionary. You cannot communicate about the topic without learning the terminology. Gas is a condition of a substance that does not have a defined shape or volume. Gases have their own unique behavior depending on different variables, such as temperature, pressure and volume. Although each gas is different, all gases work on a similar issue. This guide sets out definitions and laws related to the chemistry of gases. Gas cylinder. Paul Taylor, Getty Images Gas is in the state of the matter. The particles that make up the gas can reach a complex molecule from individual atoms. Other general information on gases: gases take on the shape and volume of the container. The density of the gases is less than its solid or liquid phase. Gases are compressed more easily than their solid or liquid phases. The gases shall be mixed completely and evenly if they are limited to the same volume. All elements of Group VIII are gases. These gases are called precious gases. The elements, which are gases at room temperature and at normal pressure, are all non-metals. The pressure is on per unit area. The pressure of the gas is the amount of force that the gas exerts on the surface of its volume. High pressure gases exert more force than low pressure gas. The SI pressure unit is pascal (Symbol Pa). Pascal equals force 1 newton per square metre. This device is not very useful for dealing with gases under real conditions, but it is a standard that can be measured and reproduced. Many other pressure units have evolved over time, mainly dealing with the gas we are most familiar with: air. The problem with air, the pressure is not constant. The pressure depends on the sea level above sea level and on many other factors. Many pressure units were originally based on average air pressure above sea level, but have become standardised. Temperature is a substance characteristic associated with the energy content of particles. Several temperature scales have been developed to measure this amount of energy, but the standard SI scale is the Kelvin temperature scale. Two other common temperature scales are the Fahrenheit (°F) and Celsius (°C) scales. Kelvin scale is an absolute temperature scale and is used in almost all gas calculations. When working with gas problems, it is important to convert the temperature readings Kelvin.Conversion to the temperature scales:K = °C + 273,15°C = 5/9(°F - 32)°F = 9/5 °C + 32 STP means standard temperature and pressure. This refers to conditions at a pressure of 1 1 at 273 K (0 °C). STP is usually used for calculations related to the density of gases or in other cases where standard conditions are met. In STP, the ideal gas mole volume of 22.4 L. Dalton Law provides that the total pressure of a mixture of gases is equal to only the sum of the individual pressures of the components. Ptotal = PGas 1 + PGas 2 + PGas 3 + ... The individual pressure of component gas is called partial gas pressure. Calculate the partial pressure using the formulaPi = XiPtotalwherePi = partial pressure of the single gas Psummer = total pressureXi = mole fraction of the individual gas, Xi, calculated by dividing the number of individual gas moles by the total number of mixed gas moles. The Avogadro Act provides that the volume of gas is directly proportional to the number of gas moles if the pressure and temperature remain constant. Basically: Gas is volume. Add more gas, the gas takes more volume when the pressure and temperature does not change. V = knwhereV = volume k = constant n = number of moles The Law of Avogadro may also be expressed asVi/ni = Vf/nfwhereVi and Vf are preliminary and final volumes and nf is the primary and final number of moles according to the Boyle Gas Act, the volume of the gas is inversely proportional to the pressure when the temperature is kept constant. P = k/VwhereP = pressure = = volumeBoyle law can also be expressed asPiVi = PfVfkus Pi and Pf are initial and final pressures Vi and Vf are initial and final pressureA volume increases, pressure decreases, or when volume decreases, pressure increases. Charles's gas law says that the volume of gas is proportional to its absolute temperature if the pressure remains constant. V = kTwhereV = volumek = constantT = absolute temperatureCharles' law can also be expressed asVi / Ti = Vf / Tiwhere Vi and Vf are the initial and final volumes of T and Tf is the initial and final absolute temperatureIf the pressure is kept constant and the temperature increase, the volume of the gas increases. When the gas cools, the volume decreases. Guy-Lussac's Gas Act says that gas pressure is proportional to its absolute temperature if the volume is kept unchanged. P = kTwhereP = pressureT = constantNeT = absolute temperatureGuy-Lussac law can also be expressed asPi/Ti = Pf/Tiwhere Pi and Pf are initial and final pressuresTi and Tf is the initial and final temperatureIf the temperature rises, the gas pressure will increase if the volume remains constant. When the gas cools, the pressure decreases. The ideal gas law, also known as the Combined Gas Act, is a combination of all the variables proposed in previous gas laws. The ideal gas law is expressed by the formulaPV = nRTwhereP = pressureV = volumen = number of gasmoles = the ideal gas constantT = absolute temperatureR value depends on the pressure units, volume and temperature. R = 0,0821 litres ·ATM/mol· K (P = ATM, V = L and T = K)R = 8,3145 J/mol· K (Pressure x Volume is energy, T = K)R = 8.2057 m3·atm/mol· K (P = atm, V = cubic metres and T = K)R = 62.3637 L·Torr/mol· K or L·mmHg/mol· K (P = torr or mmHg, V = L and T = K)The ideal gas law works well for gases under normal conditions. Adverse conditions include high pressure and very low temperatures. Kinetic gas theory is a model that explains the properties of the ideal gas. The model makes four basic assumptions: the volume of individual particles that make up the gas is negligible compared to the volume of the gas. The particles are constantly moving. Collisions between particles and the edges of the container cause gas pressure. Individual gas particles don't exert any power on each other. The average kinetic energy of the gas is proportional to the absolute gas temperature. The average kinetic energy of gases in a mixture of gases is the same. The average kinetic energy of the gas is expressed by the formula:KEave = 3RT/2 whereKEave = average kinetic energy R = ideal gas constantT = absolute temperature Average speed of the individual gas particles or the average square speed of the root can be found by the formula = [3RT/M]1/2wherevrms = average or root speed square speedR = ideal gas constantT = absolute temperatureM = molar mass Graham Law determines the gas diffusion or effusion rate inversely proportional to the square root of the molar mass of the gas.r(M)1/2 = constant place r = diffusion or effusion rate = molar massTint twice the speed of the gas can be compared to each other, using formula No1/r2 = (M2)1/2/(M1)1/2 The ideal gas law is a good approximation of the behaviour of real gases. The values predicted in the Ideal Gas Act usually remain at 5% of the measured real world values. The ideal gas law fails when the gas pressure is very high or the temperature is very low. The Van der Waals equation contains two amendments to the Ideal Gas Act and is used to more accurately predict the behaviour of actual gases. The Van der Waals equation is (P + an2/V2)(V - nb) = nRTwhereP = pressureV = volumea = gasb - the single pressure correction constant for gas = volume correction constant = number of moles unique to the gas = absolute temperature The Van der Waals equation contains pressure and volume correction to take account of interactions between molecules. Unlike ideal gases, individual particles of real gas interact with each other and have a fixed volume. Because each gas is different, each gas in the van der Waals equation has its own corrections or values for a and b. Equation.

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