Chapter 1 : The Mole and Avogadro's Constant - Chemistry LibreTexts

1 grams P is equal to mole. Note that rounding errors may occur, so always check the results. Use this page to learn how to convert between grams P and mole.

The key point to remember about solutions with two or more volatile components? All the components are represented in the vapor that is in contact with the solution. In a solution with a nonvolatile solute, only the pure vapor of the solvent is present above the solution. By the way, at this introductory level, we will only discuss solutions with two volatile components. We will discuss the real behavior of solutions in a different tutorial. A solution is composed of 1. What is Ptotal, the total vapor pressure, above this solution? It is that we also know the vapor pressures of the two components of the vapor. This is important because it allows us to calculate the composition using mole fractions of the vapor. A key point about the above result is this: The component with the higher vapor pressure? If we were to constantly sweep away the vapor from above the solution, then more of the solution would vaporize. However, what happens then is that we would remove from the solution more and more of the component with the higher vapor pressure. This fact allows us the means to separate two volatile components in a solution and obtain each substance in a relatively pure form. The general name of the separation process that exploits volatility differences is distillation. It is an extremely important research and industrial process. However, please be aware that the reality is much more complex than the discussion just above. That discussion is for another time, another class. You might be interested to know that there are some solutions that resist distillation. These solutions are called azeotropes. Here is the begining of the Wikipedia entry: This occurs because, when an azeotrope is boiled, the resulting vapor has the same ratio of constituents as the original mixture. This means that it is extremely difficult although not impossible in some cases to distill an azeotrope. A solution is prepared by mixing 0. $C_{10}H_{16}$ and $C_{10}H_{18}O$ are two of the many compounds used in perfumes and cosmetics to provide a fresh pine scent. What is the composition of the vapor in terms of mole fractions above a solution containing equal masses of these compounds at You can pick any mass of each substance, just as long as they are equal. Just like Henry Ford and the Model A: Calculate the vapor pressure of a solution of The vapor pressure of benzene is Just remember to calculate with minimal rounding-off and then round off to the correct number of sig figs at the end. Be aware that "the other" mole fraction is obtained by subtraction. Round off the first mole fraction to the proper number of sig figs, then perform the "one minus" operation.

Chapter 2 : Mole 🇧🇧 on Instagram: "Daddy Now Land Hennessy Never Stop, Never Settle.🐍•

The mole, abbreviated mol, is an SI unit which measures the number of particles in a specific substance. One mole is equal to $\times 10^{23}$ atoms, or other elementary units such as .

USDA Nutrient Database Mole poblano is the best known of all mole varieties and has been ranked as number one of "typical" Mexican dishes. It helps give the sauce its dark color, but this is also provided by the mulato peppers. Another time when the sauce is prominent is Cinco de Mayo. While this holiday is not celebrated much in the rest of Mexico, it is a major celebration in Puebla. The state is called "the land of the seven moles", with these being named mole negro, colorado, amarillo, verde, chichilo, coloradito, and mancha manteles or tablecloth stainer , all differently colored and flavored, based on the use of distinctive chilis and herbs. A Story with Recipes from Oaxaca, Mexico, question whether it is a true mole. It also includes chocolate, as well as chili peppers, onions, garlic and more, but what makes it distinct is the addition of a plant called hoja santa. It is the most complex and difficult to make of the sauces. Mole coloradito is another popular preparation, often simplified and sold as an enchilada sauce. Electricity and other modern conveniences arrived late, allowing the community to retain more of its traditions later. Panchimalco, Ocotitla, Nuztla and Tula, but those who prepared it were generally prominent women in their communities. In the s, one family made the long trek to Mexico City proper to sell some of their mole at the La Merced Market. It was successful, but they brought with them only two kilograms since it was made by hand grinding the ingredients on a metate. In the s, he was part of a small group which became a cooperative, which constructed the Las Cazuelas restaurant. This is where the first Mole Exhibition was held in Prices for mole run between 80 and pesos per kilogram, depending on the maker and the type. A number of moles are made in the town, but mole almendrado mole with almonds is signature to the area. Twenty-two brands are permitted to print "Made in San Pedro Atocpan" on their labels. The spiciness of this version is very mild. It does not contain chocolate, but generally contains tomatillos, hoja santa, chili peppers, garlic and onions to give it a green hue. Most of these must be made fresh and not from a mix, as they require a number of fresh herbs and other ingredients. Mole de olla is a stew made from beef and vegetables, which contains guajillo and ancho chiles, as well as a number of other ingredients found in moles. It is often poured over fried plantains, and is served with sesame seeds on top. However, northern versions are far less complex and generally used to make enchiladas. In Mexico, to say "to go to a mole" ir a un mole means to go to a wedding. It began outside the town, in the small community of Yenhuitlalpan, in May. Despite their success, a number in the village did not like that they were using a religious festival for commercial ends, so a separate mole festival was created for October. The most popular variety is the mole almendrado. Originally, the October version of the fair was held in the town proper, but after it became too big, it was moved to prepared fairgrounds outside along the highway. The pot was 1. Four hundred people participated in its preparation, using kilos of mole paste, 2, kilos of chicken, kilos of tortillas and 1, kilos of broth. The resulting food fed 11, people. In , they decided to hold a contest for the best mole. This was the beginning of the Feria del Mole y Tortilla Mole and Tortilla Festival , which has been held every year since then. It still features a mole cook-off and attracts hundreds of visitors from the state. This is in contrast to their mothers and grandmothers for whom mole symbolized being Mexican. The dish is being less seen in the traditional celebrations, as well. This may be because those in this stratum of society have come to prefer foreign foods. They say that many in Mexico do not consider it a gourmet product, or something that can be consumed with wine.

Chapter 3 : Mole sauce - Wikipedia

The Mole. The mole is the unit of amount in chemistry. It provides a bridge between the atom and the macroscopic amounts of material that we work with in the laboratory.

The three remaining players are asked personal and revealing questions about each other. One by one, each player is hidden in a village. The two other players are asked the same questions, and must try to match the answers given by the hidden player. After each response, the two players go either left or right in a fork in the road. If they answer all three questions correctly, they will successfully guide themselves through the village and find the hidden player. If they make just one wrong answer, they will go down the wrong fork in the road and will not find the hidden player. Two of three tests were passed. The final test sees the players check into a hotel in Ronda, Spain. All three players are locked in separate rooms, each with a different environment, different clues and different objects and resources. All three must use what they have in their rooms to figure out how to contact the others, and escape to the lobby within 90 minutes. According to clues during the game, this test occurred on the final full day of filming, October 19, The players failed at this test. Steven, Jim, and Kathryn took the final quiz. Episode 9[edit] The details of the final quiz were revealed. After taking the final quiz, the three finalists were given the results that same night. The three players sat one at a time to watch the screen to see if they were executed. The results, however, were to be kept a secret. Four months later, the executed players were reunited to see the results of the final quiz. Highlights of the season, including sabotage, and "moleish" behavior was documented, as well as secret hidden clues. It turned out that Charlie suspected Kathryn from day 1, and unwittingly gave the information to Steven, who in turn gave it Jim. In the end, Steven answered 16 out of 25 questions correctly on the final quiz. Jim answered 13 correctly. Mole Sabotage[edit] Hostage Rescue: Kathryn was part of the land-based team, and recognized that all the teams were making numerous errors. She figured out early that they were at the wrong fort, but convinced the players to look again and stalled them. The team had to decide which watch was authentic, and which was fake. Kathryn tried repeatedly to stall, and insisted on asking for additional assistance. Kathryn discussed with Wendi the day before that if asked, she would not shave her head for money. Since she was planning for her wedding in a couple months, she refused to do the task, had a good excuse, and avoided suspicion. Considering the difficulty of the game, and having reasonable suspicion that the game was unwinnable anyway, Kathryn kept a low profile. She did little to help, and simply allowed the other players to mess the game up. The game failed miserably, and she avoided all suspicion. Kathryn purposely chose to be part of the "resourceful" team. She knew the van would eventually break down, so she attempted to waste time having Steven try to fix it. She also purposely missed a turnoff, and blamed Steve for poor navigation. Fake Production Notebook test: Kathryn was the only person to read the fake production notebook, reducing suspicion about her. Kathryn took the interior, and admitted to all other players that her position was "weak. She then made a feeble attempt to defend it. The other players broke down afterwards, and blame was diverted elsewhere. Kathryn noticed that the professional pieces of art were very simple. Her strategy was to throw as much junk as possible into their piece, such that it would stand out as complex from the others. The art critic even stated that the jewels were a give-away. The producers did not give Kathryn any information about the test, so that she would exhibit genuine fear. After she fainted, she felt she had to go through with the task, otherwise it would stand out as obvious sabotage. After being given all of the information ahead of time about the rather difficult and complex test, Kathryn attempted to guide Steven and Jim though the test, and be seen as the hero who won the test for the group. She thought that winning the game would cause one last bit of confusion for the other players. Both Steven and Jim, however, were unable to pick up on her rather obvious clues, and the test failed. During the final episode, it was revealed that Kathryn struggled to keep her cover as the mole at certain times during the four weeks of filming. She started crying after Manuel and Charlie were executed, feeling sorry for them. In the later parts of the show, she broke down during the three questions test after a stinging question about whether she would cheat on her soon-to-be husband , and also broke down in her room during the hotel room test about her role in the game. Hidden Clues[edit] Episode 1: During the opening scene when the players

arrived, Kathryn was the fourth to arrive, and the word Mole has four letters in it. Night out in Paris: At dinner before the test, Anderson asks whether the players have become more superstitious. Jim reveals that he carries a baggie of his hair. He says that when it was shaved he lost his powers, like Samson. Kathryn chimes in, "Samson and Delilah.

Chapter 4 : ChemTeam: Stoichiometry: Mole-Mole Examples

1, Likes, 6 Comments - Mole ðŸ‡§ðŸ‡§ (@mole_dechief) on Instagram: "Daddy Now Land Hennessy Never Stop, Never Settle.ðŸ˜•".

The Mole The mole is the unit of amount in chemistry. It provides a bridge between the atom and the macroscopic amounts of material that we work with in the laboratory. It allows the chemist to weigh out amounts of two substances, say iron and sulfur, such that equal numbers of atoms of iron and sulfur are obtained. A mole of a substance is defined as: The mass of substance containing the same number of fundamental units as there are atoms in exactly Fundamental units may be atoms, molecules, or formula units, depending on the substance concerned. At present, our best estimate of the number of atoms in This is obviously a very important quantity. Unfortunately, the clumsy definition of the mole obscures its utility. It is nearly analogous to defining a dozen as the mass of a substance that contains the same number of fundamental units as are contained in g of Grade A large eggs. This definition completely obscures the utility of the dozen: Similarly, a mole is NA things. The mole is the same kind of unit as the dozen -- a certain number of things. But it differs from the dozen in a couple of ways. First, the number of things in a mole is so huge that we cannot identify with it in the way that we can identify with 12 things. Second, 12 is an important number in the English system of weights and measures, so the definition of a dozen as 12 things makes sense. However, the choice of the unusual number, 6. Why is this number chosen? Would it not make more sense to define a mole as 1. To understand why the particular number, 6. The atomic weight scale defines the masses of atoms relative to the mass of an atom of 12C, which is assigned a mass of exactly The number 12 is chosen so that the least massive atom, hydrogen, has a mass of about 1 actually 1. The atomic mass unit is a very tiny unit of mass appropriate to the scale of single atoms. Originally, of course, chemists had no idea of its value in laboratory-sized units like the gram. The early versions of the atomic weight scale were established by scientists who had no knowledge of the electron, proton, or neutron. When these were discovered in the late 19th and early 20th centuries, it turned out that the mass of an atom on the atomic weight scale was very nearly the same as the number of protons in its nucleus. This is a very useful correpondence, but it was discovered only after the weight scale had been in use for a long time. In their desire to be able to count atoms by weighing, chemists gradually developed the concept of the "gram-atomic weight", which was defined in exact correspondence with the atomic weight scale: Because the atomic weight scale is numerically preserved in the definition of gram atomic weights, the mass of 1 gram-atomic weight of any element could be immediately determined as the atomic weight in grams. Thus 1 gram-atomic weight of sulfur weighs Analogous terms, such as gram-molecular weight for the molecular weight of a compound expressed in grams, were similarly used. However, having to use a different term depending on whether elements or compounds were being discussed was awkward and inconvenient. For this reason, the term "mole" was adopted to signify the atomic, molecular, or formula weight of a pure substance expressed in grams. Alternative definition of the mole: The atomic, molecular, or formula weight of the substance, expressed in grams. Thus one mole of ethyl alcohol, C2H6O, weighs One mole of water weighs If we mix Further, we will know that there are 2 atoms of C and 8 atoms of H per each 2 atoms of O. Thus the mole allows us to weigh convenient amounts of material containing known numbers of atoms; i. The mole enables us to count atoms in the laboratory. The mole is useful whether or not we know how many atoms of carbon there are in If we weigh one mole of iron and one mole of sulfur, we know that these two samples contain the same number of atoms. This is the important aspect of the mole. How many atoms there are in a mole is of subsidiary importance. Nonetheless, it has become possible to determine this number. It is, of course, 6. We thus see that this number is simply a consequence of the choice that 1 mole be the formula weight in grams. It is very nice that we know it; but we do not need to know it for the mole to be useful. I would even go so far as to say that the modern definition of the mole in terms of a certain number of atoms of 12C is unfortunate, in that it suggests that the number, 6. In practice, we seldom need to know how many atoms or molecules we are working with, so in mole calculations the number 6. What is invariably used except for sample calculations in chemistry textbooks; see below! The

dual definitions of the mole can be used to find the mass of 1 amu expressed in g. Exactly 12 g of carbon contains NA atoms, each weighing exactly 12 amu. Although we are confident that we know its value quite well, some future experiment may cause us to make a small revision in the number. By necessity, the mass of 1 m in grams will change accordingly. This is not worrisome, because neither number is crucial to the utility of the mole. The atomic weight plays a dual role in chemistry. Many chemists prefer to use the term molar mass for the mass of a mole of substance. In this course, we will use the phrase Formula Weight for both situations. The meaning will be evident from context. The importance of the mole concept can be summed up as follows: This is true because 1 mole of substance contains NA atoms, molecules, or formula units of substance. Based on the formula for glucose, C6H12O6, we can make the following statements: How many moles of Fe are in 5. How many Fe atoms are contained in the sample? By definition, 1 mole of Fe is The number of Fe atoms in the sample is 0. However, even this small amount contains a huge number of iron atoms. How many sulfur atoms are in 1. We can calculate the number of moles of sulfur from the atomic weight and the given mass. What is the mass in g of 1 atom of sodium? If we know the mass of 1 mole of Na, and how many atoms are in a mole, the mass of a single atom should be easy to obtain: What mass of sulfur contains the same number of moles as are in Figure the number of moles of Fe. This is the desired number of moles of S. Convert moles of S to mass of S using the atomic weight. Hemoglobin is the oxygen-carrying protein of most mammals. Each molecule of hemoglobin contains 4 atoms of iron. How many moles of iron are contained in 0. Calculate the number of iron atoms in 0. Based on its molecular weight, hemoglobin is clearly a large molecule containing many atoms. We are not told what the atoms are, nor how many of each there are. However, we are told that each molecule of hemoglobin contains 4 atoms of iron. We can write the formula for a molecule of hemoglobin as follows: Fe4X where X represents the collection of all other atoms present. What we can say about molecules and atoms, we can say about moles. Thus 1 mole of hemoglobin contains 4 moles of iron. To obtain the second required answer, we convert mass of hemoglobin to moles hemoglobin using the molecular weight: Knowledge of the number of iron atoms per molecule of hemoglobin is enough. For oxygen, which exists in nature as diatomic molecules, O2, the statement "a mole of oxygen" is ambiguous. Does it mean a mole of oxygen molecules or a mole of oxygen atoms? These are different things. A mole of oxygen molecules contains 2 moles of oxygen atoms. For elements that exist as molecules, it is best to explicitly state whether molecules or atoms are meant. Thus "1 mole of oxygen molecules" means 6.

Chapter 5 : Convert grams P to moles - Conversion of Measurement Units

www.nxgvision.com Art. likes. Ben Mole, artist form Derby, England. Original piece's of artwork for sale and prints, request a commissioned piece of art and.

The answer is We assume you are converting between grams P and mole. You can view more details on each measurement unit: The SI base unit for amount of substance is the mole. Note that rounding errors may occur, so always check the results. Use this page to learn how to convert between grams P and mole. Type in your own numbers in the form to convert the units! You can do the reverse unit conversion from moles P to grams , or enter other units to convert below: Enter two units to convert From: When calculating molecular weight of a chemical compound, it tells us how many grams are in one mole of that substance. The formula weight is simply the weight in atomic mass units of all the atoms in a given formula. If the formula used in calculating molar mass is the molecular formula, the formula weight computed is the molecular weight. The percentage by weight of any atom or group of atoms in a compound can be computed by dividing the total weight of the atom or group of atoms in the formula by the formula weight and multiplying by Formula weights are especially useful in determining the relative weights of reagents and products in a chemical reaction. These relative weights computed from the chemical equation are sometimes called equation weights. Using the chemical formula of the compound and the periodic table of elements, we can add up the atomic weights and calculate molecular weight of the substance. A common request on this site is to convert grams to moles. To complete this calculation, you have to know what substance you are trying to convert. The reason is that the molar mass of the substance affects the conversion. This site explains how to find molar mass. We use the most common isotopes. This is how to calculate molar mass average molecular weight , which is based on isotropically weighted averages. This is not the same as molecular mass, which is the mass of a single molecule of well-defined isotopes. For bulk stoichiometric calculations, we are usually determining molar mass, which may also be called standard atomic weight or average atomic mass. You can find metric conversion tables for SI units, as well as English units, currency, and other data. Type in unit symbols, abbreviations, or full names for units of length, area, mass, pressure, and other types.

Chapter 6 : The Mole (U.S. season 1) - Wikipedia

Short commentary: when I solved part b, I simply multiplied by 2. You may ponder why that was so. You may ponder why that was so. Also, when I solved all the problems in this example, I went to a piece of paper and wrote the ratio and proportion thusly [using (b) for an example].

A stem group fossil, Cratotetraspinus, is known from the Lower Cretaceous of Brazil. The two groups, and indeed their resemblance in form to the mammalian mole family Talpidae with their powerful front limbs, form an example of convergent evolution , both developing adaptations for burrowing. The females typically take wing soon after sunset, and are attracted to areas where males are calling, which they do for about an hour after sunset. This may be to mate, or they may be influenced by the suitability of the habitat for egg-laying, as demonstrated by the number of males present and calling in the vicinity. After mating, a period of one or two weeks may occur before the female starts laying eggs. Neoscapteriscus females then retire, sealing the entrance passage, but in Gryllotalpa and Neocurtilla species, the female has been observed to remain in an adjoining chamber to tend the clutch. Further clutches may follow over several months, according to species. Eggs need to be laid in moist ground, and many nymphs die because of insufficient moisture in the soil. The eggs hatch in a few weeks, and as they grow, the nymphs consume a great deal of plant material either underground or on the surface. Mole crickets are active most of the year, but overwinter as nymphs or adults in cooler climates, resuming activity in the spring. Their digging technique is to force the soil to either side with their powerful, shovel-like fore limbs, which are broad, flattened, toothed and heavily sclerotised the cuticle is hardened and darkened. Song of Gryllotalpa gryllotalpa Male mole cricket in singing position in burrow: The burrow is shaped as a double exponential horn with bulb, forming an effective resonator. In both species, the burrow has twin openings at the soil surface; at the other end is a constriction, then a resonating bulb, and then an escape tunnel. A burrow is used for at least a week. The male positions himself head down with his head in the bulb, his tail near the fork in the tunnel. The plectrum can move forward with little resistance, but moving it backwards makes it catch each tooth, setting up a vibration in both wings. The sound-producing stroke is the raising levation of the wings. The resulting song resembles the result of modulating a pure tone with a Hz wave to form regular chirps. The throat of the horn appears to be tuned offering low inductive reactance , making the burrow radiate sound efficiently; the efficiency increases when the burrow is wet and absorbs less sound. Mole crickets are the only insects that construct a sound-producing apparatus. The loudest males may attract 20 females in one evening, when a quieter male may attract none. Crabronidae attack mole crickets, the female laying an egg on the external surface of the mole cricket, and the larva developing externally on the mole cricket host. Carabidae ; the adult beetle lays eggs near the burrows of mole crickets, and the beetle larvae find their way to the egg chamber and eat the eggs. As a last-ditch defence, they eject a foul-smelling brown liquid from their anal glands when captured; [26] they can also bite. They inhabit agricultural fields and grassy areas. They are present in every continent with the exception of Antarctica ; by , species had been described and more species are likely to be discovered, especially in Asia. The first-detected invasive mole cricket species was Neoscapteriscus didactylus, a South American species reported as a pest in St. Vincent, West Indies as early as ; by , it was a major pest of agriculture in Puerto Rico. It had probably slowly expanded its range northwards, island by island, from South America. Small scale experimental applications of the nematode Steinernema scapterisci were made in irrigated turf, but survival of the nematode was poor. It was named as Gryllotalpa africana, but was probably G. It attacked sugarcane and was targeted with Larra polita from the Philippines in , apparently successfully. They caused major problems for decades as they spread in the southeastern USA. From the late s chordane had been the insecticide of choice to control them, but when chordane was banned by the U. EPA in the s, ranchers were left with no economic and effective control method. In , a multi-authored report was published on accomplishments. It became established in a small area of southeastern Florida but had little effect on Neoscapteriscus populations. Experimentation then led to a rearing method. Populations were established, began to spread, and were monitored by use of synthetic mole cricket song. Shipment and release of the flies to states north of Florida

was thus a wasted effort. The third biological control agent to target Neoscapteriscus in Florida was the South American nematode Steinernema scapterisci. Its use as a biopesticide against Neoscapteriscus was patented, making it attractive to industry. Industrial-scale production on artificial diet allowed large-scale trial applications in pastures [47] and on golf courses, [48] which succeeded in establishing populations in several counties, and these populations spread, but sales were disappointing, and the product was withdrawn from the market in Although experimental application was made in states north of Florida, only in southern Georgia was establishment of the nematode verified, suggesting little interest in the other states. As pests[edit] The parasitoidal wasp Larra bicolor was introduced to Florida to help control Neoscapteriscus mole crickets there. The main damage done by mole crickets is as a result of their burrowing activities. As they tunnel through the top few centimetres of soil, they push the ground up in little ridges, increasing evaporation of surface moisture, disturbing germinating seeds, and damaging the delicate young roots of seedlings. In Florida from the s through the s, they were considered pests and were described as "a serious problem". Their population densities have since declined greatly. When this is applied in strips across grassland, it spreads throughout the pasture and potentially beyond within a few months and not only controls the mole crickets, but also remains infective in the soil for future years. As food[edit] Gryllotalpa mole crickets have sometimes been used as food in West Java and Vietnam. They are usually eaten fried along with sticky rice.

Chapter 7 : Mole cricket - Wikipedia

Due to the use of the same reference substance in defining the atomic mass unit and the mole, the formula mass (amu) and molar mass (g/mol) for any substance are numerically equivalent (for example, one H_2O molecule weighs approximately 18 amu and 1 mole of H_2O molecules weighs approximately 18 g).

Chapter 8 : Mole (unit) - Wikipedia

I catch this mole using only a shovel he tries to bite me several times. The bumper music is from the band New Order, album- Waiting For The Sirens Call.

Chapter 9 : Raoult's Law: Vapor Pressure and Volatile Solutes (in Ideal Solutions)

Mole crickets are members of the insect family Gryllotalpidae, in the order Orthoptera (grasshoppers, locusts, and crickets). Mole crickets are cylindrical-bodied insects about cm (in) long as adults, with small eyes and shovel-like fore limbs highly developed for burrowing.