Oakland CUSD #5

Chemistry

April 13-17, 2020

William Sewell

Week: April 13-17, 2020

Teacher: William Sewell

Communication: email: william.sewell@oakland5.org or Google Hangout-Meet
Office hours: Monday and Wednesday: 12:00 to 2:00 p.m., Tuesday and Thursday: 12:00 to 1:00 p.m.
Due Date: All assignments are due 4/20/2020 either by sending a picture of it and turning it into Google Classroom or turning it into the office.
Assignments: All assignments will be in "Google Classroom" and a paper copy will be provided from the Oakland main office. I will have office hours as listed above which we can review the assignments given and I will help you as much as needed. However, the expectation is the same as it was before. I expect you to have made a serious effort to complete the assignment, before asking for help. You will not learn anything with me just giving you the answers.

Class	Choice 1	Choice 2	Choice 3 (Enrichment)
Earth Science	Chapter 25 Test, p.45-47	Collect 15 different rock samples. Take pictures or draw each and describe them: shape, various colors, size, sharp sides/ smooth, etc.	Take pictures of the moon and record the cycle that it is in from Monday through Friday. Please use the given table to complete.
Physical Science	Chapter 13: Review Worksheet, p.35-36, and the Chapter Test, p.37-38	Record your (not family) water usage throughout the week. Please use the given table to complete.	Do speed lab of races. Record your distance and time yourself. Please use the given table to complete.
Chemistry	Unit 4 Test (To be completed with notes and other resources)	Unit 5: Relative Mass Lab video and write-up	Do the Unit 5 worksheet entitled "The Mole". Use dimensional unit conversations to complete.
Pre-calculus	Complete Composite Functions Unit Test Version 2 on Khan or paper version.	Compete a worksheet on matrices.	Watch videos on Inverse trigonometric functions and do 8 problems for the exercises. They will be assigned in Khan academy.

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Chemistry – Unit 4 Test-a

Write the letter(s) of the word(s) or phrase(s) that match the definition.

___1. This substance consists of two or more elements in a fixed mass ratio.
a. element
b. compound
c. mixture
d. pure substance

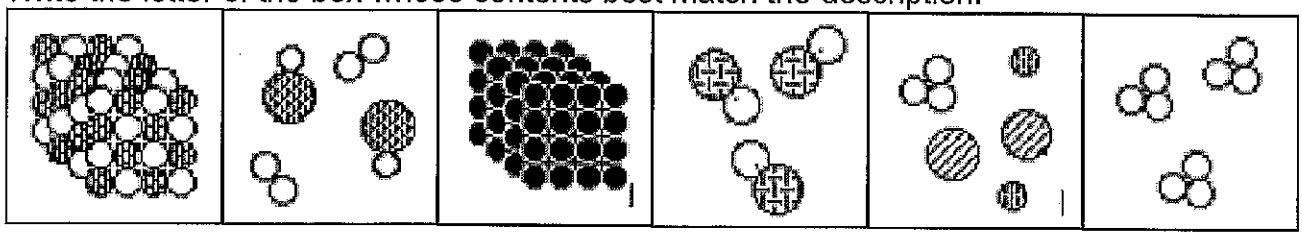
___2. This substance cannot be broken down by physical or chemical means.
a. element
b. compound
c. mixture
d. pure substance

___3. The composition of this substance is variable; its physical properties depend on the composition.
a. element
b. compound
c. mixture
d. pure substance

___4. Electrolysis can be used to separate this substance.
a. element
b. compound
c. mixture
d. pure substance

___5. This substance can be either homogeneous or heterogeneous.
a. element
b. compound
c. mixture
d. pure substance

Write the letter of the box whose contents best match the description.



a b c d e f

___6. a mixture of molecules

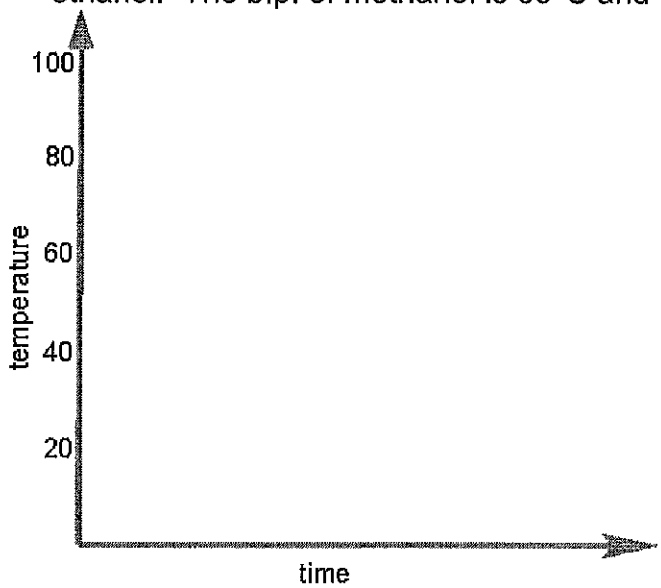
___7. atoms of a pure metal

___8. molecules of an element

___9. a solid compound

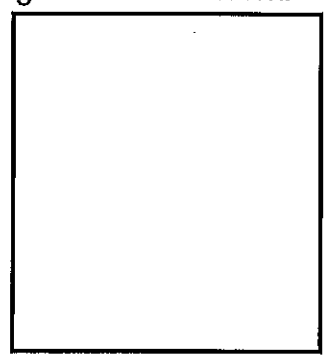
___10. a mixture of elements

11. Sketch a graph of temperature vs. time for the heating of a mixture of methanol and ethanol. The b.p. of methanol is 65°C and that of ethanol is 78°C.

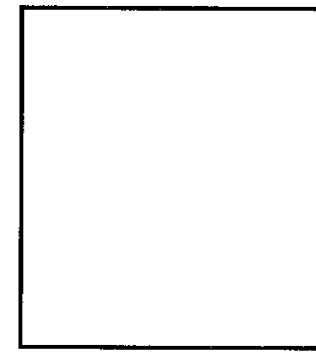


12. Describe how you could use the information in the graph you sketched for Q 11 to separate a mixture of methanol and ethanol.

13. Sketch a particle diagram representing a mixture of hydrogen and oxygen gases. Sketch a particle diagram for the compound formed when these gases react. Describe how these diagrams are different.

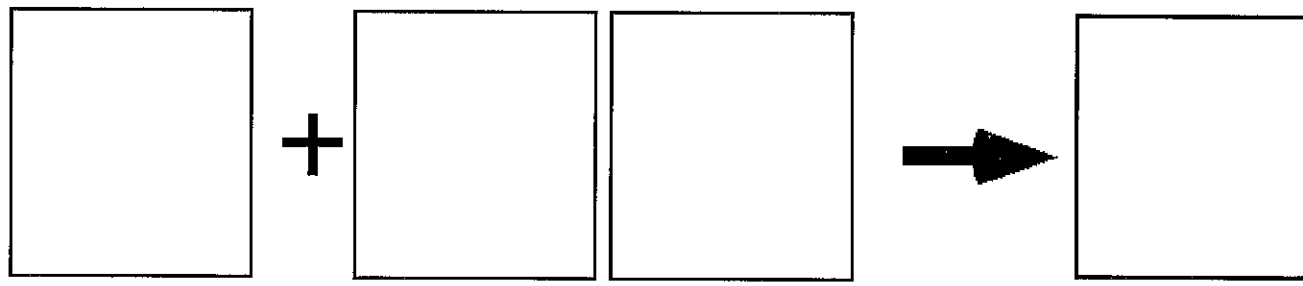


mixture



compound

14. Suppose that one volume of gas A combined with two volumes of gas B to form one volume of product when measured at the same pressure and temperature. Sketch particle diagrams for molecules of gas A, gas B and the product; assume gases A and B are monatomic.



gas A gas B product

15. If the gases in Q 14 were diatomic, how many volumes of the gaseous product would be formed? Explain.

16. Nitrogen and oxygen form several compounds. Two of these have the following mass composition.

    Compound A: 63.6 g of N and 36.4 g of O

    Compound B 46.7 g of N and 53.3 g of O

    a. Determine the value of the ratio in each compound. A ____ B _____

    b. How does the mass ratio for compound A compare to that in compound B?

    c. Sketch particle diagrams for the compounds of A and B that account for these mass ratios. Write the formula for the compound in each diagram.

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Chemistry—Unit 5 Relative Mass Lab

Purpose

The purpose of this lab is to determine the relative mass of different items and to recognize the connection between such an activity and the information on the periodic table.

Data

Object Measured	Mass (g)	Adjusted Mass (g)	Relative Mass (imu or *item mass units*)
Empty vial			
Vial + Item #1			
Vial + Item #2			
Vial + Item #3			
Vial + Item #4			
Vial + Item #5			
Vial + Item #6			

Calculations and Discussion Questions

1. Each vial contains the same number of pieces. From each mass, subtract the mass of the empty vial to determine the adjusted mass. (Do you think the empty vial will have an adjusted mass?) To find the relative mass, divide the mass of each item by the mass of the smallest item. (What will the relative mass of the smallest item be?) Don't forget units and significant figures. Show all work for **one item** below.

2. What does *relative* mean in the phrase relative mass?

3. When calculating relative mass, why is it important to be sure the same number of items are in each vial?

4. Which item is used to determine relative masses of the other items? Why?

5. Why do you think the units were changed from grams to imu's in the table above?

Conclusion

6. Which element is used to determine relative masses of the other elements? Explain the connection between this activity and the work of Gay-Lussac and Avogadro.

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Chemistry Unit 5 – The Mole

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To help you better visualize the enormous size of Avogadro's number, 6.02×10^{23}, consider the following analogies:

1. If we had a mole of rice grains, all the land area of the earth would be covered with rice to a depth of about 75 meters!

2. One mole of rice grains is more grain than the number of **all** grain grown since the beginning of time.

3. One mole of marshmallows (standard 1 in^3 size) would cover the United States to a depth of 650 miles.

4. If the Mount St. Helens eruption had released a mole of particles the size of sand grains, the entire state of Washington would have been buried to a depth equal to the height of a 10-story building.

5. A mole of basketballs would just about fit perfectly into a ball bag the size of the earth.

Your turn

Show your solutions to the following questions on the back of this sheet. Multiply by factors and show the cancellation of units. Keep 2 sf's in your answers.

6. Assuming that each human being has 60 trillion body cells (6×10^{13}) and that the earth's population is 6 billion (6×10^{9}), calculate the total number of living human body cells on this planet. Is this number smaller or larger than a mole? Divide the larger value by the smaller to determine the relative size of the two values.

7. A supercomputer, nicknamed Roadrunner, built by IBM for the Los Alamos National Labs can perform about 1.03 petaflop/s (1 petaflop is 10^{15} calculations). Determine how many seconds it would take this computer to count a mole of things. Convert this figure into years.

8. If you started counting when you first learned how to count and then counted by ones, eight hours a day, 5 days a week for 50 weeks a year, you would be judged a 'good counter' if you could reach 4 billion by the time you retired at age 65. If every human on earth (about 7×10^{9}) were to count this way until retirement, what fraction of a mole would they count?