

Chemistry BBC for Week 22 Lesson 1

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| Name/ period: | | | |
| Do Now | <p>Consider these released STAR test questions:</p> <table border="1" data-bbox="349 384 1435 905"> <tr> <td data-bbox="349 384 876 905"> <p>When a cold tire is inflated to a certain pressure and then is warmed up due to friction with the road, the pressure increases. This happens because the</p> <p>A air molecules hit the walls of the tire less frequently.</p> <p>B rubber in the tire reacts with oxygen in the atmosphere.</p> <p>C air molecules speed up and collide with the tire walls more often.</p> <p>D air molecules diffuse rapidly through the walls of the tire.</p> </td> <td data-bbox="876 384 1435 905"> <p>When someone standing at one end of a large room opens a bottle of vinegar, it may take several minutes for a person at the other end to smell it. Gas molecules at room temperature move at very high velocities, so what is responsible for the delay in detection of the vinegar?</p> <p>A the increase in the airspace occupied by vinegar molecules</p> <p>B the chemical reaction with nerves, which is slower than other sensory processes</p> <p>C attractive forces between the air and vinegar molecules</p> <p>D random collisions between the air and vinegar molecules</p> </td> </tr> </table> | <p>When a cold tire is inflated to a certain pressure and then is warmed up due to friction with the road, the pressure increases. This happens because the</p> <p>A air molecules hit the walls of the tire less frequently.</p> <p>B rubber in the tire reacts with oxygen in the atmosphere.</p> <p>C air molecules speed up and collide with the tire walls more often.</p> <p>D air molecules diffuse rapidly through the walls of the tire.</p> | <p>When someone standing at one end of a large room opens a bottle of vinegar, it may take several minutes for a person at the other end to smell it. Gas molecules at room temperature move at very high velocities, so what is responsible for the delay in detection of the vinegar?</p> <p>A the increase in the airspace occupied by vinegar molecules</p> <p>B the chemical reaction with nerves, which is slower than other sensory processes</p> <p>C attractive forces between the air and vinegar molecules</p> <p>D random collisions between the air and vinegar molecules</p> |
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| AIM to learn | SWBAT decide which gas laws to use when considering a problem. | | |
| Standard(s) | <p>Gases and Their Properties</p> <hr/> <p>CH4. The kinetic molecular theory describes the motion of atoms and molecules and explains the properties of gases. As a basis for understanding this concept:</p> <hr/> <p>CH4. a. Students know the random motion of molecules and their collisions with a surface create the observable pressure on that surface.</p> <hr/> <p>CH4. b. Students know the random motion of molecules explains the diffusion of gases.</p> <hr/> <p>CH4. c. Students know how to apply the gas laws to relations between the pressure, temperature, and volume of any amount of an ideal gas or any mixture of ideal gases.</p> <hr/> <p>CH4. d. Students know the values and meanings of standard temperature and pressure (STP).</p> <hr/> <p>CH4. e. Students know how to convert between the Celsius and Kelvin temperature scales.</p> <hr/> <p>CH4. f. Students know there is no temperature lower than 0 Kelvin.</p> | | |
| Agenda | <ol style="list-style-type: none"> 1. Do Now 2. Homework stamp/review 3. Ideal Gas Law ($PV=nRT$), worksheet 4. Dalton's Law, worksheet 5. Introduction of Molar Volume of Hydrogen lab 6. Eudiometer practice 7. Boyle's Law miniquiz 8. Worksheet group study (if time available) | | |
| Homework | Finish the worksheets, prepare for Mg/HCl lab on Wednesday. Gas Laws Quiz on Friday, no notes. | | |

Dalton's Law Practice Problems

- 1) Three flasks are connected to each other, separated only by a three-way stopcock.
 - Flask 1 has a volume of 3.000 liters and holds helium gas at a pressure of 3.500 atmospheres
 - Flask 2 has a volume of 2.000 liters and holds nitrogen gas at a pressure of 2.000 atmospheres
 - Flask 3 has a volume of 1.800 liters and holds oxygen gas at a pressure of 4.000 atmospheres

If the stopcock separating the flasks were to be opened, what would the partial pressure of each gas in the apparatus be?

- 2) What would the total pressure in the apparatus be?

- 3) What would the mole fraction of oxygen be inside the apparatus after the stopcock was opened?

- 4) If liquid water is added to the mixture, what will the mole fraction of each of the gases in the mixture be? The vapor pressure of water at 25^o C is 0.031 atm.