40

Name:
Date:
Hour: CALVIN

Chemistry ~ Ch.14 Quiz

Multiple Choice

B 1) The volume of a balloon will increase when temperature increases because: 1
a) the *particles* expand (b) the *particles* move faster
c) the *particles* transform d) the balloon shrinks

D 2) Pressure of a gas in a container comes from: 1
a) Needing to sink the game winning shot
b) Needing to stick the landing
c) Needing to come through with 2 out and 2 strikes in the final inning
(d) The gas particles making collisions with the walls of the container

B 3) The gas pressure inside a container *decreases* when 1
a) the number of gas molecules is increased
(b) the number of gas molecules is decreased
c) the temperature is increased
d) the number of molecules is increased and the temperature is increased

C 4) If two items, X and Y, are directly proportional, what happens to X when Y is tripled? 1
a) remains constant b) one third it's original value (c) triples d) doubles

D 5) If two items, P and Q, are inversely proportional, what happens to Q when P is cut in half? 1
a) remains constant b) half it's original value c) triples (d) doubles

Short answer (use arrow format, circle constant… assume fixed mass of gas)

6) State Boyle's Law 2

$P \uparrow V \downarrow$ (T)

a) Give ONE example not found in #9: Resp.

7) State Charles' Law 2

$T \uparrow V \uparrow$ (P)

a) Give ONE example not found in #9: Resp.

8) State Gay-Lussac's Law 2

$T \uparrow P \uparrow$ (V)

a) Give ONE example not found in #9: Resp.

9) Which gas law fits BEST: (abbreviate ~ C, B, or G-L's) 1pt

a) SCUBA diver B
b) Popcorn G-L's
c) Adding air to your car tires in the winter C/G-L
d) Mylar® (the shiny non latex kind) balloon shrinking in the 'cold' C/G-L
e) Plunger B
f) The gas law allows "tamper proof" lids to work G-L
g) Breathing B
h) Syringe B
i) Peeps (or soap!) in the microwave C
j) Do not incinerate a can! G-L
k) Squeezing water bottle and shooting off cap B
k) CO_2 cartridge after firing many paintballs G-L

10) Nitrous oxide (N_2O) is used as an anesthetic. The pressure on 2.50L of N_2O changes from 125 kPa to 50.5 kPa. If the temperature does not change, what will the new volume be?

3pt

$V_1 = 2.50L$
$P_1 = 125 kPa$
$P_2 = 50.5 kPa$
$V_2 = ?$

$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$

$V_2 = \frac{P_1V_1}{P_2} = \frac{(125 kPa)(2.50L)}{(50.5 kPa)} = 6.19 L$

11) If a sample of gas occupies 6.80 L at 325 °C, if the volume expands to 12.0 L, what is the new temperature?

3pt

$V_1 = 6.80L$
$T_1 = 325°C \rightarrow 598K$
$V_2 = 12.0L$
$T_2 = ?$

$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$

$T_2 = \frac{V_2T_1}{V_1} = \frac{(12.0L)(598K)}{(6.80L)} = 1055K$ OR $1060K$

12) A sample of Nitrogen gas has a pressure of 6.58 kPa at 539 K. Find the pressure if the temperature is reduced to 211 K.

3pt

$P_1 = 6.58 kPa$
$T_1 = 539K$
$P_2 = ?$
$T_2 = 211K$

$\frac{P_1}{T_1} = \frac{P_2}{T_2}$

$P_2 = \frac{P_1T_2}{T_1} = \frac{(6.58 kPa)(211K)}{(539K)} = 2.58 kPa$

13) A gas at 155 kPa and 25.0 °C has an initial volume of 1.00L. The pressure of the gas increases to 605 kPa as the temperature is raised to 125 °C . What is the new volume?

3pt

$P_1 = 155 kPa$
$T_1 = 25.0°C \rightarrow 298K$
$V_1 = 1.00L$
$P_2 = 605 kPa$
$T_2 = 125°C \rightarrow 398K$
$V_2 = ?$

$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$

$V_2 = \frac{P_1V_1T_2}{T_1P_2} = \frac{(155 kPa)(1.00L)(398K)}{(298K)(605 kPa)} = 0.342L$

19) Based on Kinetic Molecular Theory, BRIEFLY explain why a Mylar® balloon deflates when taken outside in the winter and reinflates once back inside. DRAW 2 PICTURES!

3pt

Rear. (be sure to say they S-L-O-W down)

21) Suppose you had a syringe filled with air. As you force the plunger down it becomes harder and harder to push. The factors you are changing for this gas are P and V. They are related by Boyles Law.

3pt

➔ Bonus: Draw a flamingo. (not a flaming Z)

+2

GO VIKINGS!!!

Rear.