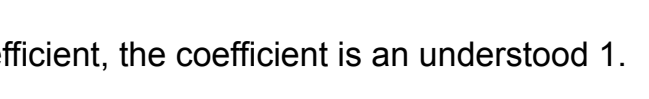


HW02

Question 1

1 pts

Consider the following **unbalanced** reaction:



What is the sum of the coefficients in the balanced reaction?

Note: If there is no coefficient, the coefficient is an understood 1.

- 8
- 5
- 6
- 3
- 4
- 10

Question 2

1 pts

Hydrogen peroxide (H_2O_2) decomposes into hydrogen (H_2) and oxygen (O_2). Which of the following represents this reaction?

- $\text{H}_2\text{O}_2 \rightarrow \text{H}_2 + \text{O}_2$
- $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}_2$
- $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}_2$
- $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2 + \text{O}_2$

Question 3

1 pts

In which state of matter are the molecules all spread out? This means the distance between the molecules is much larger than the size of the molecules themselves.

- gas
- liquid
- solid

Question 4

1 pts

What are the key physical properties of solids?

- the molecules are very close to each other
- molecules are in static positions relative to neighboring molecules
- molecules are in constant translational motion relative to each other
- molecules are very far apart from each other
- molecules are very close to each other but also move considerably among themselves

Question 5

1 pts

Which of the following substances listed has the smallest percentage in the make up of the typical composition of air here in Austin, TX ?

- argon (Ar)
- nitrogen (N_2)
- oxygen (O_2)
- carbon dioxide (CO_2)
- water (H_2O)

Question 6

1 pts

Which of the following layers of the atmosphere is closest to the ground?

- Troposphere
- Ozone
- Stratosphere
- Mesosphere

Question 7

1 pts

Which of the following simple ratios of nitrogen to oxygen is the most accurate for describing the air on this planet.

(ratios are all written as nitrogen : oxygen)

- 4 : 1
- 1 : 2
- 2 : 1
- 3 : 2
- 3 : 1

Question 8

1 pts

Which of the following substances is most variable in our atmosphere?

- Water vapor
- Carbon dioxide
- Nitrogen
- Argon

Question 9

1 pts

What is the name and the approximate molar mass of C_5H_{12} ?

- Heptane, 74 g/mol
- Pentane, 68 g/mole
- Hexane, 72 g/mol
- Pentane, 72 g/mol
- Pentane, 74 g/mol
- Hexane, 86 g/mol
- Pentonium, 72 g/mol

Question 10

1 pts

Which carbon compound contains the fewest carbon atoms?

- Methane
- Hexane
- Propane
- Chlorobutane

Question 11

1 pts

According to Boyle's Law, pressure and volume have a(n)...

- indirect relationship
- direct relationship
- inverse relationship
- none of these are correct

Question 12

1 pts

A container holding an ideal gas is compressed to half its original volume at constant temperature. According to Boyle's Law, the pressure of the gas...

- halves
- doubles
- triples
- quadruples

Question 13

1 pts

An inflated balloon has a volume equal to 2.3 L at 20°C . When the temperature is reduced to 10°C , the volume...

- doubles
- is halved
- decreases by a small amount
- increases by a small amount

Question 14

1 pts

Catalytic converters reduce the amount of _____ in car exhaust.

- CO
- O_3
- CO_2
- N_2

Question 15

1 pts

The two most abundant gases in an inhaled breath are...

- Nitrogen and oxygen
- Nitrogen and water vapor
- Oxygen and carbon dioxide
- Carbon dioxide and nitrogen

Question 16

1 pts

The air we exhale contains about 100 times more of which gas than the air we breathe from the atmosphere?

- Carbon dioxide
- Argon
- Oxygen
- Nitrogen

Question 17

1 pts

Which pollutant is present as a solid particulate in air?

- Soot
- Ozone
- Carbon monoxide
- Sulfur dioxide

Question 18

1 pts

Which of the following pollutants **cannot** be detected by odor?

- CO
- O_3
- NO_x
- SO_x

Question 19

1 pts

Refer to the graph of elevation vs pressure found [here](https://mccord.cm.utexas.edu/chembook/page.php?chnum=2§=5) (<https://mccord.cm.utexas.edu/chembook/page.php?chnum=2§=5>). What is the approximate pressure (in kPa) at 4500 m altitude?

- 57 kPa
- 50 kPa
- 60 kPa
- 63 kPa
- 45 kPa

Question 20

1 pts

A 34 L container holds 0.80 moles of gas at 300 K. What is the pressure (in atm)?

- 0.58 atm
- 20 atm
- 440 atm
- 1.2 atm

Question 21

1 pts

A gas is expanded from 3.60 L and 76.8 kPa to 8.10 L at constant temperature. What is the final pressure?

- 2240 kPa
- 34.1 kPa
- 173 kPa
- 68.2 kPa
- 9.48 kPa
- 86.4 kPa

Question 22

1 pts

An industrial tube used to transport methane has an internal temperature equal to 18°C . When high quantities of methane are transported, the pressure increases to 3.6 atm in 12 L of tubing. How many moles of methane (n) are present in this 12 L tubing?

- 0.038 moles
- 29 moles
- 3.6 moles
- 1.8 moles

Question 23

1 pts

Consider the following **unbalanced** environmental reaction:

First balance the reaction. Then calculate the volume of NO gas produced when 0.952 moles of NO_2 are reacted to completion with excess H_2O at STP.

Reminder: STP is 0°C and 1 atm pressure. One mole occupies 22.4 L at STP.

- 4.80 L
- 7.11 L
- 43.8 L
- 32.7 L
- 85.7 L

Question 24

1 pts

Your friend is using the ideal gas law to solve a question. Your friend's work is shown below:

$$PV = nRT$$

$$(3.7 \text{ atm})(4.3 \text{ L}) = (0.5 \text{ moles})(R)(387.77 \text{ K})$$

What is the proper R value to complete the equation?

- 0.08206 L torr / mol K
- 0.08206 L atm / mol K
- 8.314 J / mol K
- 62.36 L torr / mol K
- 62.36 L atm / mol K