Chemistry 115 Name

Dr. Cary Willard

Quiz 8a (20 points) November 4, 2013

Data: 1 atm=760 torr=760 mm Hg, K=oC+273; PV=nRT, R=0.0821 L atm/mol K=62.4 L torr/mol K

1. (4 points) The pressure of a gas is 854 torr. Calculate the pressure in atmospheres.

$$?atm=854 torr×\frac{1 atm}{760 torr}=1.12 atm$$

1. (4 points) A gas with a temperature of 67oC and a pressure of 852 torr is in a closed container. Calculate the new pressure if the temperature is decreased to 11oC with no change in volume.

$$\frac{P\_{1}}{T\_{1}}=\frac{P\_{2}}{T\_{2}} P\_{2}=P\_{1}\left(\frac{T\_{2}}{T\_{1}}\right)=852 torr\left(\frac{284 K}{340 K}\right)=712 torr$$

1. (4 points) A sample of argon gas has a volume of 63.4 L at a pressure of 6.24 atm at a certain temperature and pressure. If the pressure is reduced to 2.53 atm, what will the new volume of the argon gas be?

$$P\_{1}V\_{1}=P\_{2}V\_{2} V\_{2}=V\_{1}\left(\frac{P\_{1}}{P\_{2}}\right)=63.4 L\left(\frac{6.24 atm}{2.53 atm}\right)=156 L$$

1. (4 points)A 45.0 g sample of chlorine gas (Cl2) has a temperature of 45oC at 0.378 atm. What is the volume of the chlorine gas in L?

$$mol Ar=45.0 g Cl\_{2}×\frac{1 mol Cl\_{2}}{70.90 g Cl\_{2}}=0.635 mol Cl\_{2}$$

$$PV=nRT V=\frac{nRT}{P}=\frac{\left(0.635 mol\right)\left(0.0821 L atm\right)\left(308 K\right)}{mol K\left(0.854 atm\right)}=18.8 L$$

1. (4 points) Use kinetic molecular theory to explain why gases exert a pressure.

Gases are composed of small particles traveling in straight lines in space. When they hit a surface, they exert pressure on that surface.

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Quiz 8b (20 points) November 4, 2013

Data: 1 atm=760 torr=760 mm Hg, K=oC+273; PV=nRT, R=0.0821 L atm/mol K=62.4 L torr/mol K

1. (4 points) The pressure of a gas is 687 torr. Calculate the pressure in atmospheres.

$$?atm=687 torr×\frac{1 atm}{760 torr}=904 atm$$

1. (4 points) A gas with a temperature of 67oC and a pressure of 671 torr is in a closed container. Calculate the new pressure if the temperature is decreased to 11oC with no change in volume.

$$\frac{P\_{1}}{T\_{1}}=\frac{P\_{2}}{T\_{2}} P\_{2}=P\_{1}\left(\frac{T\_{2}}{T\_{1}}\right)=671 torr\left(\frac{284 K}{340 K}\right)=560. torr$$

1. (4 points) A sample of argon gas has a volume of 27.9 L at a pressure of 6.24 atm at a certain temperature and pressure. If the pressure is reduced to 2.53 atm, what will the new volume of the argon gas be?

$$P\_{1}V\_{1}=P\_{2}V\_{2} V\_{2}=V\_{1}\left(\frac{P\_{1}}{P\_{2}}\right)=27.9 L\left(\frac{6.24 atm}{2.53 atm}\right)=68.8 L$$

1. (4 points)A 55.0 g sample of chlorine gas (Cl2) has a temperature of 45oC at 0.609 atm. What is the volume of the argon gas in L?

$$mol Ar=55.0 g Cl\_{2}×\frac{1 mol Cl\_{2}}{70.90 g Cl\_{2}}=0.775 mol Cl\_{2}$$

$$PV=nRT V=\frac{nRT}{P}=\frac{\left(0.775 mol\right)\left(0.0821 L atm\right)\left(308 K\right)}{mol K\left(0.609 atm\right)}=32.2 L$$

1. (4 points) Use kinetic molecular theory to explain why gases exert a pressure.

Gases are composed of small particles traveling in straight lines in space. When they hit a surface, they exert pressure on that surface.