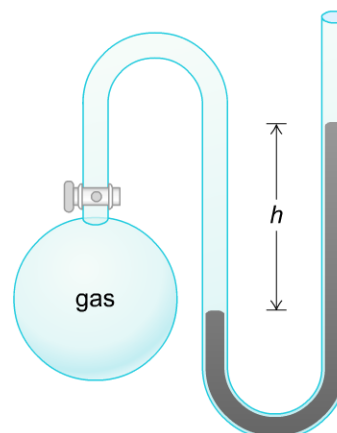What is the pressure of the gas in this mercury manometer if h = 57 mm and atmospheric pressure is 779 mmHg?

Number

[ ] **mmHg**

gas

h

An ideal gas is allowed to expand from 3.80 L to 24.7 L at constant temperature.

By what factor does the volume increase?

Number

[ ]

The pressure will

○ increase by that same factor.
○ decrease by that same factor.

If the intial pressure was 121 atm, what is the final pressure?

Number

[ ] **atm**

A sample of an ideal gas at 1.00 atm and a volume of 1.91 L was placed in a weighted balloon and dropped into the ocean. As the sample descended, the water pressure compressed the balloon and reduced its volume. When the pressure had increased to 70.0 atm, what was the volume of the sample? Assume that the temperature was held constant.

Number

[ ] **L**

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If the initial temperature of an ideal gas at 2.250 atm is 62.00 °C, what final temperature would cause the pressure to be reduced to 1.750 atm?

Number

[ ] ° C

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A sample of an ideal gas has a volume of 3.70 L at 13.80 °C and 1.30 atm. What is the volume of the gas at 21.00 °C and 0.998 atm?

Number

[ ] **L**

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If 6.67 moles of an ideal gas has a pressure of 2.95 atm, and a volume of 23.99 L, what is the temperature of the sample in degrees Celsius?

Number

[ ] ° C

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An open flask sitting in a lab fridge looks empty, but we know that actually it is filled with a mixture of gases called air. If the flask volume is 3.00 L, and the air is at standard temperature and pressure, how many gaseous molecules does the flask contain?

Number

[ ] **molecules**

General Chemistry 4th Edition
McQuarrie • Rock • Gallogly

University Science Books
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A gaseous mixture contains 419.0 Torr of $H_2(g)$, 384.7 Torr of $N_2(g)$, and 73.5 Torr of Ar(g). Calculate the mole fraction, X, of each of these gases.
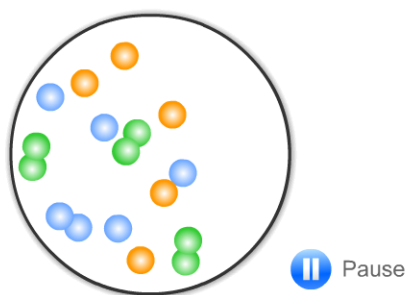
$$X_{H_2} = $$

Number

[ ]

$$X_{N_2} = $$

Number

[ ]

$$X_{Ar} = $$

Number

[ ]

Consider this molecular-level representation of a gas.

⏸ Pause

If the partial pressure of the diatomic gas is 0.420 atm, what is the total pressure?

Number

[ ] atm

A 7.95-L container holds a mixture of two gases at 35 °C. The partial pressures of gas A and gas B, respectively, are 0.199 atm and 0.573 atm. If 0.150 mol of a third gas is added with no change in volume or temperature, what will the total pressure become?

Number

[ ] atm

A gas mixture is made by combining 5.3 g each of Ar, Ne, and an unknown diatomic gas. At STP, the mixture occupies a volume of 11.98 L.

What is the molar mass of the unknown gas?
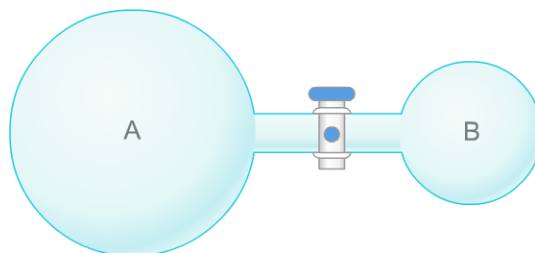
Number

[ ] g / mol

Identify the unknown gas.

- ○ Cl_2
- ○ F_2
- ○ N_2
- ○ H_2
- ○ O_2

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Container A holds 727 mL of ideal gas at 2.70 atm. Container B holds 159 mL of ideal gas at 4.30 atm. If the gases are allowed to mix together, what is the resulting pressure?

Number

[ ] atm

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3.25 g of an unknown gas at 49 °C and 1.00 atm is stored in a 2.95-L flask.

What is the density of the gas?

Number

[ ] g / L

What is the molar mass of the gas?

Number

[ ] g / mol

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Chlorine can be prepared in the laboratory by the reaction of manganese dioxide with hydrochloric acid, HCl(aq), as described by the chemical equation

$$MnO_2(s) + 4HCl(aq) \longrightarrow MnCl_2(aq) + 2H_2O(l) + Cl_2(g)$$

How much $MnO_2(s)$ should be added to excess HCl(aq) to obtain 115 mL of $Cl_2(g)$ at 25 °C and 745 Torr?

Number

☐	g MnO$_2$

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Hydrazine, N$_2$H$_4$, may react with oxygen to form nitrogen gas and water.

$$N_2H_4(aq) + O_2(g) \longrightarrow N_2(g) + 2H_2O(l)$$
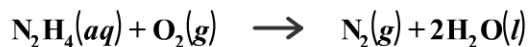
If 3.75 g of N$_2$H$_4$ reacts and produces 0.750 L of N$_2$, at 295 K and 1.00 atm, what is the percent yield of the reaction?

Number

☐	%

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At a certain temperature and pressure, one liter of CO$_2$ gas weighs 1.35 g.
What is the mass of one liter of CH$_4$ gas at the same temperature and pressure?

Number

☐	g

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Of these gases, which has the fastest-moving molecules (on average) at a given temperature?

- ○ HBr
- ○ NO$_2$
- ○ C$_2$H$_6$
- ○ They all have the same average speed.

Which gas molecules have the highest average kinetic energy at a given temperature?

- ○ HBr
- ○ NO$_2$
- ○ C$_2$H$_6$
- ○ They all have the same average kinetic energy.

$N_2(g)$ effuses at a rate that is _____ times that of $Xe(g)$ under the same conditions.

Number

$$\frac{rate_{N_2}}{rate_{Xe}} =$$

[ ]

A sample of $Br_2(g)$ takes 38.0 min to effuse through a membrane. How long would it take the same number of moles of $Ar(g)$ to effuse through the same membrane?

Number

[ ] min

Which of the following statements are evidence that gases do not always behave ideally? Check all that apply.

☐ When two gases are mixed, they follow Dalton's law of partial pressures.

☐ At 4 K and 1 atm, helium is a liquid.

☐ It is impossible to compress a gas enough so that it takes up no volume.

☐ CO_2 gas becomes dry ice (solid CO_2) at 1 atm and -78.5 °C.