



## Self Assessment B

This assignment is due on January 27 2012, 12:45 PM EST.

### Question 1

Which of the following is not a characteristic of substances in the gas phase?

- ☐ A) Substances in the gas phase have much lower densities than the same substances would have in the liquid or solid phase.
- ☐ B) A mixture of substances in the gas phase will form a homogeneous solution, whereas the same mixture might not form a homogeneous solution in the liquid phase.
- ☐ C) Substances in the gas phase retain their shapes easily.
- ☐ D) Substances in the gas phase are compressible.

### Question 2

The pressure of a gas was determined to be 485 cm Hg. What is the equivalent pressure in atmospheres?

- ☐ A) 0.64 atm
- ☐ B) 33.0 atm
- ☐ C) 6.38 atm
- ☐ D) 1.57 atm
- ☐ E) 6.46 atm

### Question 3

A sample of gas occupies 3.00 L at 760 torr. Calculate the volume the gas will occupy if the pressure is changed to 1.45 atm and the temperature remains constant.

- ☐ A) 2.07 L
- ☐ B) 0.48 L
- ☐ C) 4.35 L
- ☐ D) 2280 L
- ☐ E) 1570 L

### Question 4

A gas sample has a volume of 4.50 L when the temperature is 28 °C and the pressure is 1.00 atm. What will be the new volume of the gas when the temperature is changed to 0.0 °C and the pressure to 850 torr?

- ☐ A) 0.25 L
- ☐ B) 3.7 L
- ☐ C) 0.15 L
- ☐ D) 4.4 L
- ☐ E) 5.48 L

### Question 5

What volume would be occupied by 0.545 mol of a gas at 75 °C and 0.678 atm?

- ☐ A) 60.3 L
- ☐ B) 28.6 L
- ☐ C) 4.95 L
- ☐ D) 33.8 L
- ☐ E) 23.0 L

### Question 6

Calculate the density of methane, CH<sub>4</sub>, at 18 °C and 3.65 atm.

- ☐ A) 39.6 g/L
- ☐ B) 2.45 g/L
- ☐ C) 0.41 g/L
- ☐ D) 0.71 g/L
- ☐ E) 1.85 g/L

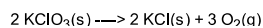
### Question 7

What is the molar mass of a gas whose density at STP is 3.74 g/L?

- ☐ A) 83.8 g/mol
- ☐ B) 5.99 g/mol
- ☐ C) 41.9 g/mol
- ☐ D) 1.19 x 10<sup>-2</sup> g/mol

### Question 8

What volume of oxygen can be collected at 20 °C and 730 torr from the complete reaction of 100 g of KClO<sub>3</sub>, according to the chemical equation shown below?



- ☐ A) 20.0 L  
☐ B) 30 L  
☐ C) 28 L  
☐ D) 18.9 L  
☐ E) 30.6 L

#### Question 9

Calculate the root-mean-square velocity of  $\text{CO}_2$  at  $0^\circ\text{C}$ .

- ☐ A) 23.8 m/s  
☐ B) 393 m/s  
☐ C) 227 m/s  
☐ D) 12.4 m/s  
☐ E) 39.1 m/s

#### Question 10

Using the van der Waals equation, calculate the pressure exerted by 15.0 mol of carbon dioxide confined to a 3.00-L vessel at  $56.0^\circ\text{C}$ . Note: Values for a and b in the van der Waals equation:  $a = 3.59 \text{ L}^2\cdot\text{atm/mol}$ , and  $b = 0.0427 \text{ L/mol}$ .

- ☐ A) 23.2 atm  
☐ B) 2.16 atm  
☐ C) 81.9 atm  
☐ D) 96.4 atm