

Gas Problems Set 5

Show all work and box in answers.

1. A gas has a volume of 20 ml at 200 K. What will its volume be at 300 K?

30 ml

2. A gas has a volume of 20 ml at 800 C. What will its volume be at 400 C?

12.5 ml

3. A gas has a volume of 20 ml at 4 atm. What will its volume be at 1 atm?

80 ml

4. A gas has a volume of 40 ml at 800 mm Hg. What will its volume be at 460 mm of Hg?

69.6 ml

5. A gas has a volume of 20 ml at 2 atm and 300 K. What will its volume be at standard temperature and pressure?

36.4 ml

6. A gas has a volume of 400 ml at 3 atm and 400 K. What will its volume be at 2 atm and 300 K?

450 ml

7. A gas has a volume of 800 ml at 5 atm and 200K. What will its volume be at 10 atm and 400 K?

800 ml

8. A gas has a volume of 400 ml at 6 atm and 300 K. What will its volume be at 300 K and 4 atm?
600 ml

9. A gas has a volume of 300 ml at 5 atm and 500 K. What will its volume be at 3 atm and 300 K?

300 ml

10. A gas has a volume of 25 ml at 200 K. What temperature would be needed to raise the volume to 50 ml.

400 K

11. A gas has a volume of 25 ml at 15 C and 2 atm. What pressure would be needed to make the volume 50 ml at 30 C?

1.05 atm

12. What pressure would be needed to change 50 ml of gas at 1 atm to a volume of 10 ml?

5 atm

13. Is the relationship between pressure and volume directly proportional, or is it inversely proportional? Explain why.

Inverse—as P increases, V decreases

14. Explain why Charles' law is valid.

As temperature increases molecules move faster. This increases the force on the inside of the container, so the container expands.

15. Explain in terms of temperature, pressure, and constant volume why it is dangerous to heat a closed can of soda.

If the volume is constant, an increase in temperature will cause an increase in pressure. At some point, the container will explode.