

Gases Mix-Pair-Share

1. A 1.50 L sample of gas is heated from 22°C to 450°C. If pressure remains constant, what is the final volume of the gas? (3.7 L)
2. What pressure would be required to compress 2500 L of hydrogen gas at 1.0 atm into a 31 L tank? (81 atm)
3. A 500. mL sample of gas is at a pressure of 640. mmHg. If temperature remains constant and the volume changed to 800. mL, then what is the new pressure? (400. mmHg)
4. A gas occupies a volume of 211 mL at 27°C and 745 mmHg pressure. Calculate the volume the gas would occupy at 150°C and 652 mmHg. (340 mL)
5. When extended, a bicycle pump has a volume of 200. L at 17°C and 106.6 kPa. To what temperature must the gas be cooled for its volume to be reduced to 150. L at a pressure of 98.6 kPa? (201 K)
6. What volume would be occupied by 3.2 mol of oxygen gas at a pressure of 1.50 atm and a temperature of 25°C? (52 L)
7. A fixed quantity of gas is compressed at a constant temperature from a volume of 6.38 L to 2.08 L. If the initial pressure was 522 mmH, what is the final pressure? (1.60×10^3 mmHg)
8. How many grams of argon would it take to fill a light bulb with a volume of 0.475 L at STP? (0.85 g)
9. The temperature inside a refrigerator is 4.0°C. If a balloon with an initial temperature of 22°C and volume of 0.50 liters, is placed inside the fridge. What will be the volume of the balloon when it is fully cooled by the fridge? (0.47 L)
10. How hot will a 2.3 L balloon have to get to expand to a volume of 400. L? Assume that the initial temperature of the balloon is 25°C. (5.2×10^4 K)
11. What volume would be occupied by 10.0 grams of oxygen gas at a pressure of 1.50 atm and a temperature of 35°C? (5.3 L)
12. An air-filled balloon has a volume of 225 L at 0.94 atm and 25°C. Soon after, the pressure changes to 0.99 atm and the temperature changes to 0.0°C. What is the new volume of the balloon? (220 L)
13. A balloon is inflated with 0.412 moles of helium gas to a pressure of 1.26 atm. If the desired volume of the balloon is 1.03 L, what must the temperature be in kelvin? (38.4 K)
14. What pressure is exerted by 0.625 mole of a gas in a 45.4 L container at -24.0°C? (0.281 atm)
15. A 5.3 liter container is filled with a gas at 42°C to a pressure of 839 mmHg. How many moles of the gas are needed to fill the container to these conditions? (0.23 mol)

16. A rigid container is filled with a gas at 309 K and 426.4 kPa. If the temperature is decreased to 245 K, what will be the new pressure in kPa? (338 kPa)
17. A gas at 88.3°C and 3.07 atm is pressurized to 7.1 atm. What is the new temperature of the gas? (840 K)
18. A gas is initially at 500. K and 3.4 L. The temperature is changed to 1780. K causing the volume to change to 7.9 L and pressure to 950 mmHg. What was the initial pressure of the gas? (620 mmHg)
19. Calculate the volume, in liters, occupied by 0.423 moles of ammonia gas at 99.3 kPa and 37°C. (11 L)
20. Determine the amount, in moles, of 0.80 L of ammonia gas at 0.925 atm and 27°C. (3.0×10^{-2} mol)
21. A gas originally at STP is placed into a 6.388 liter piston. The piston is compressed to a new volume of 4.091 liters and the pressure is measured to be 1.28×10^3 mmHg. What is the new temperature of the gas? (294 K)
22. 1.00 L of a gas at standard temperature and pressure is compressed to 473 mL. If temperature remains constant, what is the new pressure of the gas? (2.11 atm)
23. Synthetic diamonds can be manufactured at pressures of 6.00×10^4 atm. If 2.00 liters of gas at 1.00 atm is compressed to a pressure of 6.00×10^4 atm, what would be the volume of the gas? (3.33×10^5 L)
24. Atmospheric pressure on the peak of Mt. Everest can be as low as 150 mmHg, which is why climbers need to carry oxygen tanks. If the climbers carry 10.0 liter tanks with an internal gas pressure of 3.04×10^4 mmHg, what will be the volume of the gas when it is released from the tanks? (2.0×10^3 L)
25. A diver has 0.05 L of gas in his blood under a pressure of 250 atm. When the diver rises to a pressure of 50.0 atm, what will be the volume of the gas? (0.25 L)
26. On hot days, you may have noticed that potato chip bags seem to “inflate”, even though they have not been opened. If a 250 mL bag at a temperature of 19°C is left in a car which has a temperature of 60.°C, what will be the new volume of the bag? (290 mL)
27. 5.05 grams of hydrogen gas at 638 K is placed into a 11.0 liter flask. How many kPa does the gas exert? (1.21×10^3 kPa)
28. A sample of carbon dioxide gas is placed into a 2.00 liter balloon at 34°C. The balloon is cooled to a temperature of 12°C. What will be the new volume of the balloon? (1.9 L)