1

In the following reaction, which reactant is a Bronsted-Lowry base? $HCl(aq) + KHS(aq) \rightarrow KCl(aq) + H_2S(aq)$

2

In the following reaction, which reactant is a Bronsted-Lowry acid? $H_2CO_3(aq) + Na_2HPO_4(aq) \rightarrow NaHCO_3(aq) + NaH_2PO_4(aq)$

3

What volume, in mL of 4.74 **M** H_2SO_4 must be used to prepare 441.5 mL of 2.66**M** H_2SO_4?

4

If 10.0 mL of 3.31 *M* HCl is titrated with 0.200 *M* NaOH, what volume (in mL) of sodium hydroxide solution is required to neutralize the acid?

$HCl(aq) + NaOH(aq) \rightarrow NaCl(aq) + H_2O(l)$
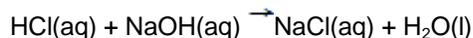
5

What is the term for a solution that contains the maximum amount of solute that can dissolve at a given temperature?

6

A balloon contains 0.88 mol N_2, 0.26 mol O_2, 0.036 mol He and 0.028 mol H_2 at 822.3 mm Hg. What is the partial pressure of O_2 in mm Hg?
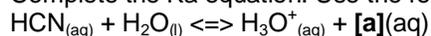
7

What is the volume of 10.0 g of argon gas at 127.2°C and 775 kPa pressure?

8

What mass of KCl (74.551 g/mol) is dissolved in 282 mL of a 1.56 **M** KCl solution?

9

Complete the Ka equation. Use the formatting used in OWL.
$HCN_{(aq)} + H_2O_{(l)} <=> H_3O^+{}_{(aq)} +$ **[a]**(aq)

10

What is the concentration of hydronium when the pOH is 13.68

11

What is the concentration of hydronium when the pH is 2.826

12

A solution of KCl (74.551 g/mol) is prepared by dissolving 8.57 g of the KCl in 68.01 g of water. What was the mass % of the solution?

13

According to the kinetic molecular theory, the pressure of a gas in a container will decrease if the

14

32.88 g of 54 % Na_2CO_3 (105.989 g/mol) solution contains what mass of solvent?

15

An unknown gas effuses 1.36 times faster than krypton. What is the molar mass of the gas?

16

A basketball is inflated to a pressure of 1.4 atm in a 20.0°C garage. What is the pressure of the basketball outside where the temperature is -30.7°C? format: 123.4 atm

17

A balloon filled with helium gas at 44.9°C occupies 2.91 L at 1.00 atm. The balloon is immersed in liquid nitrogen at -182.2°C, raising the pressure to 5 atm. What is the volume of the balloon in the liquid nitrogen? format: 1.23 L

18

Which is the **smallest** quantity of pressure?

19

Assume that you have a sample of gas in a cylinder with a moveable piston, as shown in diagram (1). The initial pressure, number of moles, and temperature of the gas are noted on the diagram.
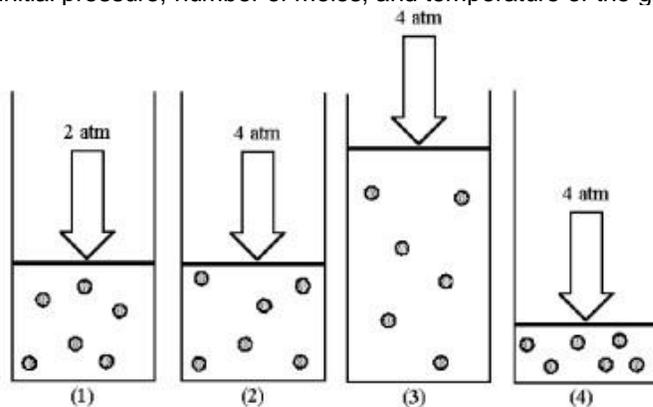
T = 325 K
n = 0.6 mol

Which diagram (2)-(4) most closely represents the result of doubling the pressure and doubling the temperature while keeping the number of moles of gas constant?

20

A solution is prepared by dissolving 14.78 g of Na_2CO_3 (105.989 g/mol) in enough water to make 339 mL of solution. What was the molarity of the solution?