

2017 Chemistry Lab Test- Workshop version

<p>With the syringe valve open, adjust the volume in the syringe to 10 ml. Attach the syringe to the sensor. Plug the pressure & temperature sensors into the TI calculator. Record the volume, pressure & temp. Adjust the volume in 1 ml increments from 20 ml to 2 ml, recording pressure & volume. Convert volumes to $1/v$. Plot $1/v$ on the x-axis, vs. Pressure on the y axis. See Power Point or sheet on CD for more details.</p>			
	1)	What is the Boyle's Law constant for air?	G
	2)	Using only the initial volume, pressure, and temperature, how many moles of air are in the syringe?	G
	3)	Using only the initial volume, pressure, and temperature, how many molecules are in the syringe?	G
	4)	Does air always behave like an Ideal gas? What evidence do you have to support your position?	G
<p>Measure out 3 ml of HCl & put in 50 ml beaker. Attach temp. probe to TI. Note temperature. Start adding NaOH to acid a few drops at a time, quickly, until temperature stops going up, while stirring with probe. Measure the volume of the solution. Repeat for H₂SO₄.</p>			
	5)	How many ml of NaOH react with 3 ml of HCl?	T
	6)	What is the stoichiometry of the reaction of HCl/NaOH?	T
		7) What is the balanced equation?	T
	8)	How many ml of NaOH react with 3 ml of H ₂ SO ₄ ?	T
	9)	What is the stoichiometry of the reaction of H ₂ SO ₄ /NaOH?	T
		10) What is the balanced equation?	T
<p>Mass Alka-Seltzer tablet. Put in 500 ml Erlenmeyer Flask. Put in 2-hole stopper with gas probe in one hole and syringe with 20 ml water in the other. Add water. Record maximum pressure. Take the temperature of the solution.</p>			
		11) Write the chemical equation for the reaction of the Alka-Seltzer and water.	G
	12)	Given analysis from package, how many moles of CO ₂ should be produced?	G
	13)	What is the volume & pressure of gas produced?	G
	14)	How many moles of gas were produced?	G
	15)	What is the % error?	G
	16)	How do you account for the difference between the theoretical and observed gas produced?	G
<p>Record temperature of 10 ml water. Add .5g NH₄Cl. Stir w/probe & record max/min temperature. Repeat w/NaCl & CaCl₂.</p>			
	17)	Which salt should be used for making a cold pack?	T
	18)	What are the enthalpies of solution of the 3 salts?	T
<p>Attach 3 temp. probes to TI. Wrap a piece of filter paper around each probe and secure with a rubber band. Soak each probe in a different liquid for 30 s and allow the probes to air dry while recording the temperature for 4 min.</p>			
	19)	Which liquid had the strongest intermolecular forces?	T
	20)	Which liquid had the weakest intermolecular forces?	T

Chemistry test with answers.

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~0.22	1)	What is the Boyle's Law constant for air?	G
~5X10 ⁻⁴ n=PV/RT	2)	Using only the initial volume, pressure, and temperature, how many moles of air are in the syringe?	G
3x10 ²⁰ N=PV/KT	3)	Using only the initial volume, pressure, and temperature, how many molecules are in the syringe?	G
Air behaves as an ideal gas in linear part of graph only-nonlinear part has molecular interactions	4)	Does air always behave like an Ideal gas? What evidence do you have to support your position?	G
Measure out 3 ml of HCl & put in 50 ml beaker. Attach temp. probe to TI. Note temperature. Start adding NaOH to acid a few drops at a time, quickly, until temperature stops going up, while stirring with probe. Measure the volume of the solution. Repeat for H ₂ SO ₄ .			
3	5)	How many ml of NaOH react with 3 ml of HCl?	T
1:1	6)	What is the stoichiometry of the reaction of HCl/NaOH?	T
HCl + NaOH → NaCl + H ₂ O	7)	What is the balanced equation?	T
6	8)	How many ml of NaOH react with 3 ml of H ₂ SO ₄ ?	T
1:2	9)	What is the stoichiometry of the reaction of H ₂ SO ₄ /NaOH?	T
H ₂ SO ₄ + 2 NaOH → 2 H ₂ O + Na ₂ SO ₄	10)	What is the balanced equation?	T
Mass Alka-Seltzer tablet. Put in 500 ml Erlenmeyer Flask. Put in 2-hole stopper with gas probe in one hole and syringe with 20 ml water in the other. Add water. Record maximum pressure. Take the temperature of the solution.			
NaHCO ₃ + HC ₆ H ₇ O ₇ → CO ₂ + H ₂ O + NaC ₆ H ₇ O ₇	11)	Write the chemical equation for the reaction of the Alka-Seltzer and water.	G
1.916g/84 g/mole=0.02281	12)	Given analysis from package, how many moles of CO ₂ should be produced?	G
.58859 l, 1.559-1=.559 atm.	13)	What is the volume & pressure of gas produced?	G
(.559)(.58859)/(.0821*296)=.0135	14)	How many moles of gas were produced?	G
40.7%	15)	What is the % error?	G
Solubility of CO ₂ in H ₂ O accounts for difference	16)	How do you account for the difference between the theoretical and observed gas produced?	G
Record temperature of 10 ml water. Add .5g NH ₄ Cl. Stir w/probe & record max/min temperature. Repeat w/NaCl & CaCl ₂			
NH ₄ Cl	17)	Which salt should be used for making a cold pack?	T
NH ₄ Cl 7.6 kJ/m NaCl -1 kJ/m CaCl ₂ -15.8kJ/m	18)	What are the enthalpies of solution of the 3 salts?	T
Attach 3 temp. probes to TI. Wrap a piece of filter paper around each probe and secure with a rubber band. Soak each probe in a different liquid and allow the probes to air dry while recording the temperature.			
Water	19)	Which liquid had the strongest intermolecular forces?	T
Methanol	20)	Which liquid had the weakest intermolecular forces?	T