2025 Chemistry Lab Test- Workshop version

Put 10 ml $Ba(OH)_2$ solution in 50 ml beaker. Put conductivity probe attached to running TI calculator & CBL into beaker. Draw up .1M H_2SO_4 into Berrel Pipette. Count how many drops it takes to make 1 ml by dropping the acid into the 10 ml graduated cylinder. Start dropping the .1M H_2SO_4 into the $Ba(OH)_2$ recording the number of drops and conductivity until the conductivity starts to go back up.

	1)	Write and balance the net ionic equation for the reaction of $Ba(OH)_2$ & H_2SO_4	R
	2)	Based on your titration data, how many moles of Ba(OH)2 were in the original beaker?	R
	3)	What type of reaction was just done?	R
	4)	Based on your titration data, what should the dried product have weighted?	R

Into 10 ml grad. Cylinder, put 5 ml .002M $Fe(NO_3)_3$ & 1 ml .002 M KSCN. Dilute to 10 ml. Pour into cuvette. Repeat using 2 ml KSCN, 3 ml KSCN & 5 ml KSCN. Set up Calorimeter attached to TI.. Set calorimeter to 470 nm. Put 1^{st} 3 cuvettes into calorimeter, marking Absorbance of each. Plot curve of Absorbance vs. concentration of KSCN. Put last cuvette in and note Absorbance. Pour solution into a test tube. Put in hot water bath 5 minutes. Determine Absorbance. Put back in test tube and put in ice bath 5 minutes. Determine absorbance.

	5)	What is the concentration of the Iron(III) in the cuvettes before reacting?	E
	6)	What is the concentration of the $FeSCN^{+2}$ in the 1^{st} 3 cuvettes?	E
	7)	What is the concentration of the SCN^- in the last tube before reacting?	E
	8)	What is the slope of the Beer-Lambert equation from the standard curve?	E
	9)	What is the concentration of the $FeSCN^{+2}$ in the last tube?	E
	10)	What is the concentration of the unreacted iron(III) in the last tube?	E
	11)	What is the concentration of the unreacted SCN^- in the last tube?	E
	12)	What is the equilibrium constant of the reaction and does it lie on the reactant or product side?	E
	13)	Is reaction endothermic or exothermic?	E

Calibrate pipet. Pu Zn in the Hydrogen generator. Add HCl. Put lid on tight. Put yeast in Oxygen generator. Add peroxide. Put pipet filled with water & place over oxygen generator. Fill part way w/gas, then place over hydrogen generator and finish filling. Place lite match by opening of pipet. Determine correct ratios of oxygen and hydrogen to get biggest bang and hence correct stoichiometry of reaction

	14)	Write balanced equation for reaction at pipette opening	R
	15)	Write balanced equation for hydrogen generator	R
	16)	Write balanced equation for oxygen generator	R
	17)	What type of reaction occurred at pipette opening?	R
	18)	What type of reaction occurred in hydrogen generator?	R
	19)	What type of reaction occurred in oxygen generator?	R

Pour 10 ml of unknown acid into beaker. Determine volume of 1 drop from pipette. Attach pH electrode to TI. Take a pH reading. Start dropping .100 M NaOH into beaker a drop at a time, recording volume added and pH with each 5 drops. Continue to pH~9.

	20)	Determine pKa of acid	E
	21)	Determine equilibrium constant of acid	E

Chemistry Laboratory Workshop Test Answers

Put 10 ml $Ba(OH)_2$ solution in 50 ml beaker. Put conductivity probe attached to running TI calculator & CBL into beaker. Draw up .1 M H_2SO_4 into Berrel Pipette. Count how many drops it takes to make 1 ml by dropping the acid into the 10 ml graduated cylinder. Start dropping the .1M H_2SO_4 into the $Ba(OH)_2$ recording the number of drops and conductivity until the conductivity starts to go back up.

Ba^{2+}+2 OH^- + 2H^+ + SO_4^{2*} → $BaSO_4$+2H_2O	1)	Write and balance the net ionic equation for the reaction of $Ba(OH)_2$ & H_2SO_4	R
.001 moles	2)	Based on your titration data, how many moles of Ba(OH)2 were in the original beaker? (.1M)(~.010 l)	R
Double Replacement	3)	What type of reaction was just done?	R
.001(137+32+4(16))=.23g	4)	Based on your titration data, what should the dried product have	R

Into 10 ml grad. Cylinder, put 5 ml .002M $Fe(NO_3)_3$ & 1 ml .002 M KSCN. Dilute to 10 ml. Pour into cuvette. Repeat using 2 ml KSCN, 3 ml KSCN & 5 ml KSCN. Set up Calorimeter attached to TI. Start EasyData. Set calorimeter to 470 nm. Put 1st 3 cuvettes into calorimeter, marking Absorbance of each. Plot curve of Absorbance vs. concentration of KSCN. Put last cuvette in and note Absorbance. Pour

.005(.002)/.010 = .001M	5)	What is the concentration of the Iron(III) in the cuvettes before	E
.0001M, .0002M, & .0006M	6)	What is the concentration of the $FeSCN^{+2}$ in the 1st 3 cuvettes?	E
.005*.002/.010 = .001M	7)	What is the concentration of the SCN^- in the last tube before	E
~160	8)	What is the slope of the Beer-Lambert equation from the	E
.026/160 = .000163	9)	What is the concentration of the $FeSCN^{+2}$ in the last tube?	E
.001-.000163 = .000837	10)	What is the concentration of the unreacted iron(III) in the last	E
.001-.000163 = .000837	11)	What is the concentration of the unreacted SCN^- in the last	E
.000163/(.ooo837*,000837) =200 Product side	12)	What is the equilibrium constant of the reaction and does it lie on the reactant or product side?	E
exothermic	13)	Is reaction endothermic or exothermic?	E

Calibrate pipet. Pu Zn in the Hydrogen generator. Add HCl. Put lid on tight. Put yeast in Oxygen generator. Add peroxide. Put pipet filled with water & place over oxygen generator. Fill part way w/gas, then place over hydrogen generator and finish filling. Place lite match by opening of pipet. Determine correct ratios of oxygen and hydrogen to get biggest bang and hence correct stoichiometry of reaction

$2H_2+O_2 \rightarrow 2H_2O$	14)	Write balanced equation for reaction at pipette opening	R
$Zn + 2HCl \rightarrow ZnCl_2 + H_2$	15)	Write balanced equation for hydrogen generator	R
$2H_2O_2 \rightarrow H_2O + O_2$	16)	Write balanced equation for oxygen generator	R
Composition	17)	What type of reaction occurred at pipette opening?	R
Single Replacement(Redox)	18)	What type of reaction occurred in hydrogen generator?	R
Decomposition	19)	What type of reaction occurred in oxygen generator?	R

Pour 10 ml of unknown acid into beaker. Determine volume of 1 drop from pipette. Attach pH electrode to TI. Take a pH reading. Start dropping .100 M NaOH into beaker a drop at a time, recording volume added and pH with each 5 drops. Continue to pH~9.

5.41	20)	Determine pKa of acid	E
$3.89X10^{-6}$	21)	Determine equilibrium constant of acid	E