Determination of pKa of a weak acid using pH meter

- Take fresh water in a beaker containing electrode.
- Measure 50 ml of weak acid (A or B or C) using measuring jar and transfer to a cleaned beaker (150 ml) containing glass rod.
- Refill the burette with NaOH solution (Don't through the solution in the burette).

For calibration

- Keep the 3rd knob (MODE) to temp mode and use the first knob (temp knob) to set to 25°C.
- Keep the 3rd knob to pH MODE and use the second knob (CAL) to set the value written on the equipment (ex. 7.7).
- Keep the electrodes from water beaker to a beaker containing experimental solution.(weak acid)
- Shake the solution using glass rod and note down the reading (say 3.3) for 0.0 addition of NaOH (before adding NaOH from the burette)
- Add 0.5 ml of NaOH each time and note down the values for each addition.
- Continue the titration until jump is observed (say 5.5, 5.4, 5.9, and 9.7) and note down five more values after the jump.

Estimation of Iron present in given solution using potentiometry

- Take fresh water in a beaker containing electrode.
- Measure 50 ml of FAS solution (stainless steel-light blue colour) using measuring jar and transfer to a cleaned beaker (150 ml) containing glass rod.
- Add two test of dilute sulphuric acid.
- Refill the burette with K2Cr2O7 solution (Don't through the solution in the burette).

For calibration

- Keep the 3rd knob (MODE) to temp mode and use the first knob (temp knob) to set to 25°C.
- Keep the 3rd knob to pH CHK MODE and use the second knob (CAL) to set the value written on the equipment (ex. 45).
- Keep the 3rd knob to mV MODE to do the experiment
- Keep the electrodes from water beaker to a beaker containing experimental solution. (Iron solution + H2SO4)
- Shake the solution using glass rod and note down the reading (say 256) for 0.0 addition of K2Cr2O7 (before adding K2Cr2O7 from the burette)
- Add 0.5 ml of K2Cr2O7 each time and note down the values for each addition.
- Continue the titration until jump is observed (say 250, 282,302,345, and 758) and note down five more values after the jump.

Conductometric titration of HCl vs NaOH

- Take fresh water in a beaker containing electrode.
- Measure 50 ml of HCl solution using measuring jar and transfer to a cleaned beaker (150 ml) containing glass rod.
- Refill the burette with NaOH solution (Don't through the solution in the burette).

For calibration

- Keep the 2nd knob (MODE) to temp mode and use the first knob (temp knob) to set to 25°C.
- Keep the 2nd knob to COND at 25 °C.
- Keep the 3rd knob to 200 mS mode to do the experiment
- Keep the electrodes from water beaker to a beaker containing experimental solution. (HCL solution)
- Shake the solution using glass rod and note down the reading (say 42) for 0.0 addition of NaOH solution (before adding NaOH solution from the burette)
- Add 0.5 ml of NaOH each time and note down the values for each addition.
- Continue the titration until it decreases to minimum point and increases.
- Stop the expt when you get almost same initial value (ex. 42, 39……16,15, 17,……38, 42)

Copper Colorimetry

- Refill the respective burette with $CuSO_4$ (light blue colour), Ammonia solution and Water.
- Arrange the 50 mL volumetric flask in the following order

  Blank, 2 mL, 4 mL, 6 mL, 8 mL, 10 mL, Test solution
- Add 5 mL ammonia each for all the volumetric flask including blank and test solution bottle
- Add 2 ml, 4 ml, 6 ml, 8 ml and 10 ml $CuSO_4$ solution from the burette to the respective burette containing the same number volumetric flak.
- Don't add $CuSO_4$ to blank
- Don't add $CuSO_4$ to test solution and get it from the respective faculty
- Add water to all the volumetric flask from the water bottle upto the neck.
- From neck to the mark, add water from the water burette.
- Shake the solution and get uniform concentration and maintain the same order

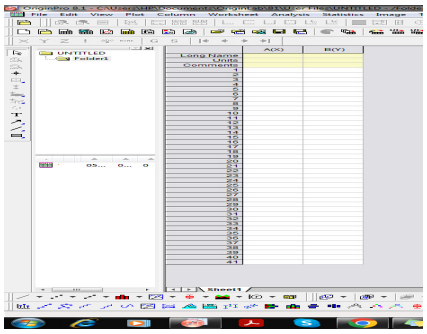
For calibration

- Keep the filter to 620 nm (nearby number)
- Keep the equipment in %T mode by pressing Mode Button.
- Take the blank solution (80 %) in the glass cuvette, dry the cuvette, and keep it in sample place at the top of the equipment.

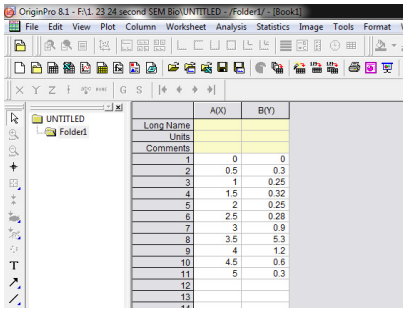
- Monitor has to show 100, if not use SET 100 knob and set to 100.
- Keep the empty block tube in the same place. Don't take solution.
- Monitor has to show 00, if not use SET ZERO knob and set to 00.
- Then the equipment is calibrated with respect to blank and block. Don't touch any know.
- Keep the equipment in ABS mode to do the expt. for your prepared solution.
- Take the 2 mL $CuSO_4$ volumetric flask, transfer to a glass cuvetter, dry and keep it in the same place.
- Note the Absorbance value (say 0.04).
- Continue the expt. for all the solution prepared including TEST solution also.

Computational graph using Origin software

- Click on origin 8.5
- X-Y column appears

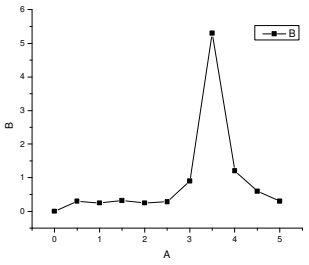


- X-Y column appears
- Enter X-axis value from your expt.
- Enter Y -axis value from your expt.

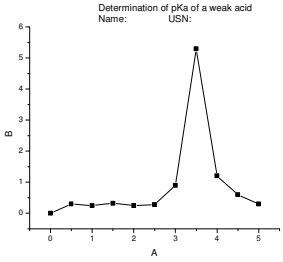


	A(X)	B(Y)
Long Name		
Units		
Comments		
1	0	0
2	0.5	0.3
3	1	0.25
4	1.5	0.32
5	2	0.25
6	2.5	0.28
7	3	0.9
8	3.5	5.3
9	4	1.2
10	4.5	0.6
11	5	0.3
12		
13		

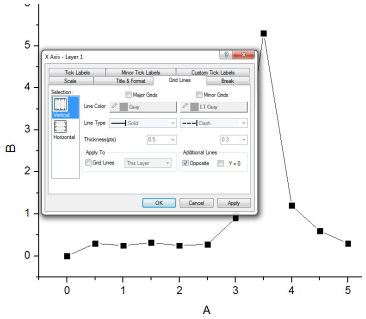
- Select both X and Y axis
- Click on left side bottom icon 2nd icon for 3rd and 4th expt and 3rd icon for 1st and 2nd expt.
- Graph appears

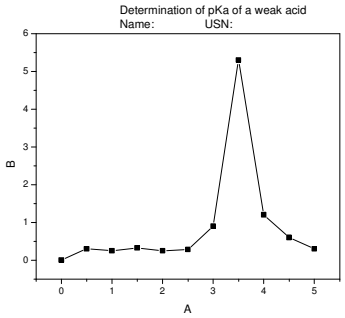


- Click on file, save project as opj format with any file name
- Click on B (right side top) edit and write the title of your experiment, and in the next line your name and USN no. and drag to the centre.
- Select the title, right click, background, None, Then line/box disappears to your name.

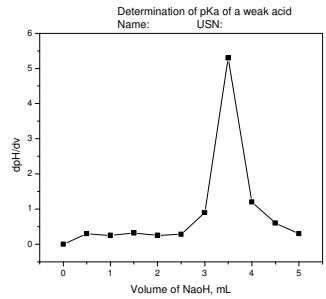


- Click on X axis line, Go to grid, click on Opp √ in box.
- Do the same for Y axis.
- Opposite side will get line





- Click on A (x – axis) edit and change the axis from ZERO to your last values in x axis.
- Same way do it on B (y – axis) and edit.



- Click on x – axis value and edit, scale, changes the values accordingly.
- Do the same for Y axis value.
- Go to print and print to PDF and save.
- Take the PDF version and get the print.