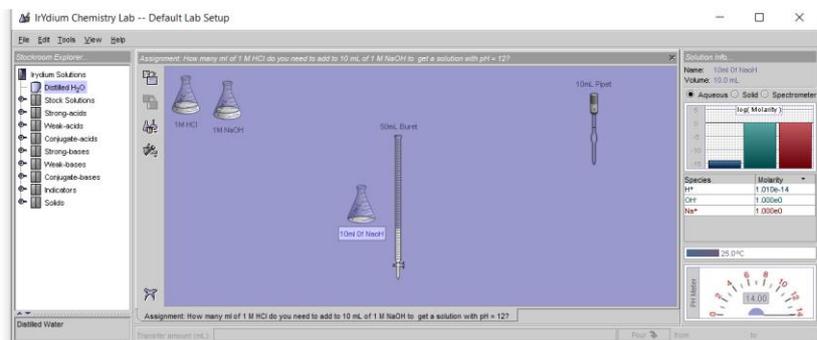


How many ml of 1 M HCl do you need to add to 10 mL of 1 M NaOH to get a solution with pH = 12?

Pipet out 10ml of NaOH into conical flask. Fill the burette with 15 ml HCl. The pH meter shows 14.



Realistic transfer			Significant amount transfer		
Initially a definite volume of 5 ml is added, then 2 ml followed by realistic amount is added.			Initially a definite volume of 7 ml is added, then 1 +1 ml followed by significant amount is added.		
Transfer of 5 ml acid to conical flask containing NaOH showed a pH value of 13.51.			Transfer of 7ml acid to conical flask containing NaOH showed a pH value of 13.17.		
S.NO	Volume(ml)	pH	S.NO	Volume(ml)	pH
1	5.000	13.51			
2	7.000	13.18	1	7.000	13.17
3	8.028	13.03	2	8.000	13.01
4	8.726	12.83	3	9.000	12.68
5	9.075	12.68	4	9.200	12.61
6	9.519	12.39	5	9.712	12.16
7	9.625	12.28	6	9.753	12.09
8	9.673	12.21	7	9.700	12.17
9	9.727	12.13	8	9.772	12.06
10	9.776	12.05	9	9.782	12.04
11	9.822	11.95	10	9.793	12.02
To get a reading of pH 12 on pH meter Volume required is $(9.776 + 9.822)/2 = 9.799$ ml.			To get a reading of pH 12 on pH meter Volume required is 9.802 ml.		

Observations:

- a) Realistic transfer results are better than > significant transfer > precise transfer.
- b) Large Variations in reading are noted when solutions are transferred through graduated cylinder (as observed in real laboratory)

Questions:

1. Temperature is continuously changing, so which one to take.
2. Can you please explain... When we add 0.05 ml to the conical flask we are getting slightly more volume both in Realistic transfer and Significant figure transfer i.e., we are getting a third digit after decimal.