

The HCl Titration Lab

Your task is to determine the molarity of a hydrochloric acid solution. The solution is approximately 0.1 M. You also need to determine the uncertainty in your calculated concentration.

Make a THAM solution in a 250 volumetric flask. You need to make up a solution of THAM so that the maximum possible volume is 45 mL of HCl when 50 mL of THAM is titrated. Use the analytical balance to weigh out the THAM.

Titrate 3-4 times to the bromocresol green endpoint.

Determine the uncertainties in the following way:

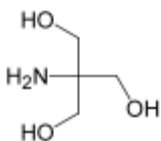
For the molar mass, use the values on the periodic table in the front of the text.

For the balance, assume each weighing is good to ± 0.0002 grams. Use the absolute uncertainties of both weighings to determine the absolute uncertainty of the mass used.

For the pipet and volumetric flask use the tolerances listed in Chapter 2 of the text as the uncertainties.

For the buret readings use ± 0.01 or ± 0.02 for each reading depending on your own estimate of your ability to read the buret. Use the absolute uncertainties of both readings to determine the absolute uncertainty of the volume delivered.

The fundamental equation you will use for the calculation is $M_a V_a = M_b V_b$, so the calculation of the uncertainty in the molarity of the acid will be made using relative uncertainties.



THAM, Tris(hydroxymethyl)aminomethane

Tris, 2-Amino-2-(hydroxymethyl)-1,3 propanediol