BioSyntheSizer Application Note

Titration Pipette (Tit-Pip)

Adjust the pH of your solution whenever it is needed...

A valuable tool for the BSyS head is a pipette with which the pH in a solution can be automatically changed. It consists of a commercial glass electrode with amplifier and three capillaries with the following functions, all of which require an extra syringe pump:

- Addition of acid in small amounts
- Addition of base in small amounts
- Mixing by aspirating and delivering the liquid in the vial

A pH change is necessary e.g. for hydrolysis or protonation of reaction products or when the next step of the synthesis requires neutral pH.

The device works in both pH directions and in larger (about 3 ml) and smaller (about 500 µl) sample volumes.

How the system adjusts the pH is compiled by using the graphical "Sequence" feature of the GeSiM Robotics control software; parameters needed are the added volumes per step for large and small pH deviations, and the final pH range. If the sequence is processed within a larger procedure, pH adjustment will take place automatically.

So whenever the pH must be controlled in a process, e.g. for chemical synthesis, you should use the Tit-Pip. It should also be applicable for larger volumes.

3 tubes (acid/base/mixing)

Holder

pH electrode

Capillaries
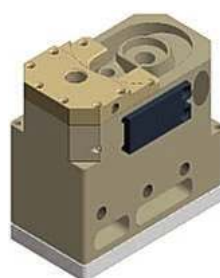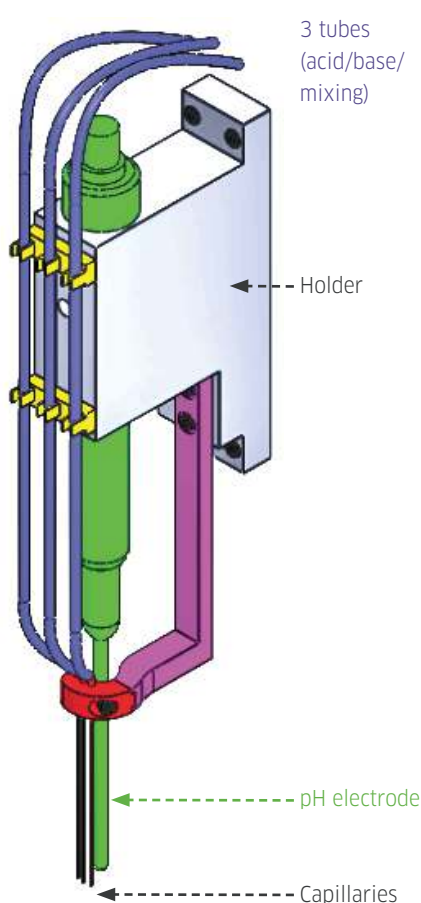
Wash station with air blade for efficient drying (top) and Tit-Pip in vial (left)

Small vial filled with 3 M KCl for pH electrode storage on the work plate

μl added:
NaOH ▬
HCl ▬
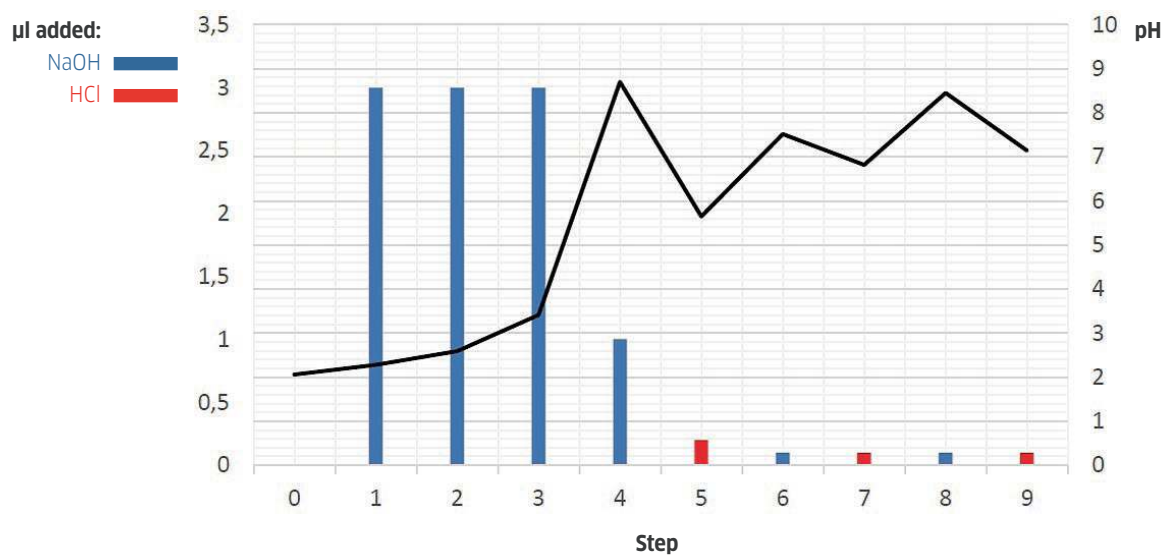
Titration example for an acetonitrile (ethanenitrile) solvent acidified with unbuffered hydrochloric acid. Three millilitres of this solution were automatically pH-adjusted with increments of 1 mole/l NaOH (blue) or HCl (red) as shown. Increments get smaller as the desired pH is approached.

GESIM