Protocol for Buffer Stock Solution 1

Preparation of a buffer stock solution:

- Created from an acidic and basic form of one chemical (e.g., Na/K phosphate)
- Where both acidic and basic components are at the same initial concentration
- Where pH is adjusted by addition of one component to the other

Step 1: Identification of the buffer stock solution concentration

The required buffer stock solution concentration can be found in the production report of each specific solution (see example in Table 1).

Step 2: Calculation of the amount of each chemical required to prepare 1 liter of stock solution.

Amount required in g = molarity (M) x FW x liters solution

Using the example in Table 1:

Amount in g of Buffer A = 1 x 50.00 x 1 = 50.00 g

Amount in g of Buffer B = 1 x 148.00 x 1 = 148.00 g

Step 3: Buffer stock solution preparation (1 liter).

1. **Weigh the required amount of Buffer chemical B into a 1 liter beaker.**
2. **Add water to 1 liter final volume.**
3. **Stir until all of Buffer B chemical is in solution.**
4. **Weigh the required amount of Buffer A chemical into a 1 liter beaker.**
5. **Add water to 1 liter final volume.**
6. **Stir until all of Buffer A chemical is in solution.**
7. **Measure the pH of the Buffer A stock solution using a pH meter.**
8. **Add Buffer B stock solution to bring the pH to slightly below 5.4.**
9. **Keep the buffer stock solution at room temperature for 24 hours*.**
10. **Adjust the pH value to 5.4 by adding Buffer B solution.**
11. **Filter the buffer stock solution using a 0.22 µm filter.**

* Since the acid/base reaction is usually exothermic, this step will bring the solution back to room temperature.

Table 1. Example of Buffer Stock Solution Makeup Found in Production Report

Formulation	Chemical FW
1.0 M Buffer A (acid form)	50.00
1.0 M Buffer B (base form)	148.00
Final pH = 5.4	

The value of a chemical's formula weight (FW) is the sum of the atomic weights of the atoms found in one formula unit (including its hydration state) of an ionic compound. For other information about each chemical, please refer to the production report specific for each solution.

Things to remember:

- All chemical information can be found in the production report for each solution.
- Amount of chemical required for each solution is calculated thus:

If concentration is given as X M:

Amount in grams = X x FW x FV (liters)

If the concentration is given as X% v/v:

Volume required = X ml per 100 ml

If the concentration is X% w/v:

Amount in grams required = X g/100 ml

Units Definition

M: Molarity of chemical

FV: Final volume of solution

FW: Formula weight of chemical