

## Crystallization Solution D Protocol

### Preparation of a Crystallization Solution.

- Created from one or more chemicals with a buffer
- Does not need to be pH adjusted
- Contains a buffer at a set concentration

### Step 1: Identification of the crystallization solution characteristics.

The required component concentration(s) can be found in the production report (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 of solution

Using the example in Table 1:

Amount of chemical X required in g =  $30/100 \times 1000 = 300$  g

Amount of chemical Y required in g =  $1.5 \times 123.45 \times 1 = 185.18$  g

Amount of 1 M buffer Z required in ml =  $0.1 \text{ M} \times 1 \text{ liter} \times 1.0 \text{ M} = 100$  ml

### Step 3: Crystallization solution preparation (1 liter).

1. Weigh and/or measure the required amount(s) of chemical(s) into a beaker.
2. Add water to 95% of the final volume (~ 950 ml) and stir thoroughly until all components have dissolved.
3. Add water to give a final volume of 1 liter.
4. Filter the crystallization solution using a 0.22 µm filter.
5. Transfer the solution to the desired format (e.g., 24- or 96-well plate) in a sterile environment.

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

**Table 1. Identification of the Crystallization Solution characteristics.**

Formulation	Chemical FW
30% (w/v) Chemical X	4000
1.5 M Chemical Y	123.45
0.1 M Buffer Z at pH = 7.5	
Initial concentration of Buffer Z = 1.0 M	

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 =  $X \times \text{FW} \times \text{FV (liters)}$   
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 =  $X \text{ g}/100 \text{ ml}$

### Units Definition

M: Molarity of chemical

FV: Final volume of solution

FW: Formula weight of chemical