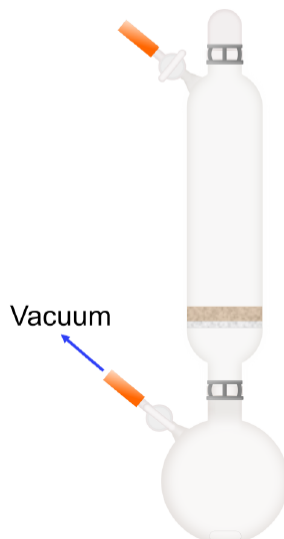


## 5.2: Filtration through Celite

Filtrations through Celite are commonly employed in synthetic inorganic chemistry to remove fine solids such as metal salts from reaction mixtures. They are particularly useful for large scale reactions where a standard [cannula filtration](#) would take too long.

### Step 1

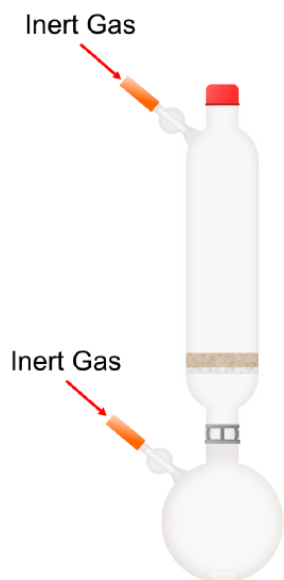
A Schlenk flask equipped with a stir bar, glass filter frit with a layer of Celite (pre-dried in an oven), and Schlenk cap is greased, assembled and [cycled](#) onto the Schlenk line. It is recommended to leave the assembly under vacuum for 30-60 minutes for the first cycle to ensure the frit and Celite is thoroughly dried.



Cycling a filter frit and receiving flask onto the Schlenk line.

### Step 2

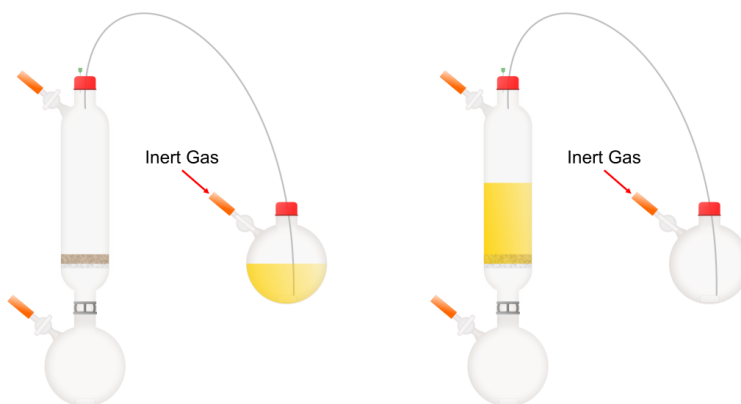
Once cycled onto the Schlenk line, the apparatus is **carefully** backfilled with inert gas – pulling vacuum from the receiving Schlenk flask sidearm and then backfilling from the filter frit sidearm (ensuring that the other stopcock is closed) is recommended to avoid disruption of the Celite layer. The Schlenk cap is replaced with a rubber septum under a positive pressure of inert gas.



Filter assembly under inert gas.

### Step 3

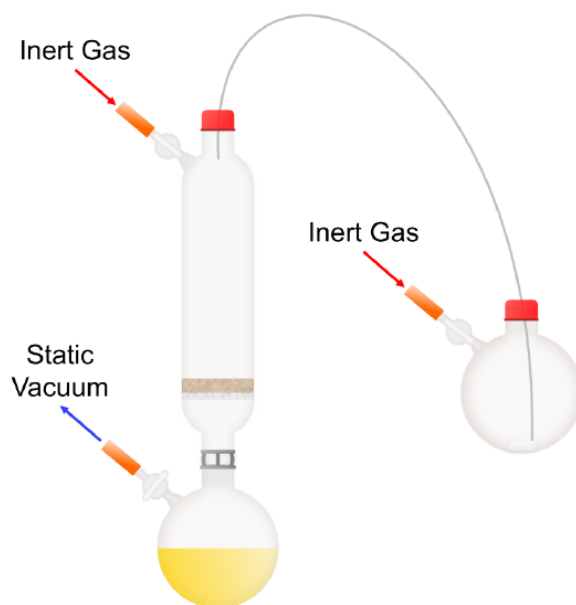
The reaction mixture to be filtered is transferred to the filter frit via [cannula transfer](#).



Cannula transferring the suspension into the filter frit.

### Step 4

Once the reaction mixture has been transferred to the filter frit, the bleed needle is removed but the cannula is kept in place since this facilitates any further washing or extraction steps. If the filter frit does not have an in-built sidearm, then it is essential to keep the cannula in place to provide a constant feed of inert gas. A pressure differential is required to initiate the filtration, which can be achieved by establishing a static vacuum in the Schlenk line hosing attached to the receiving flask. This may have to be periodically refreshed to speed up the filtration.



Completed filtration through Celite.

### Step 5

Once the filtration is complete, additional solvent can be transferred either into the original reaction flask or directly into the filter frit to further extract the solids. The receiving flask is then put back under inert gas, the cannula is removed and cleaned, and the filter frit is replaced with a greased glass stopper ready for further manipulations.

#### Hints and tips

- For reactions mixtures that are too thick to be transferred by cannula, it may be necessary to attach the filter stick and receiving flask directly to the transfer flask and carefully turn the set-up 180° to pour the reaction mixture through the glass frit. A small plug of oven-dried glass wool can be placed above the Celite in the filter stick to prevent it from moving.

- The same technique can also be used with  $\text{SiO}_2$  or  $\text{Al}_2\text{O}_3$  as a means of removing polar impurities.

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