

* Requirement for crystallization

a saturated solution
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RCPHKMC 2021-2022 S.3 Chemistry

To extract **pure sodium chloride crystals** from sea water, **crystallization** is employed.

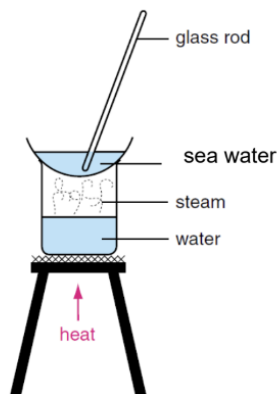
過濾

① crystal 晶體

Step 1: Filter the insoluble solid from the solution by **filtration**.

② pure

Step 2: Warm the **filtrated sea water** in an evaporating dish until a **saturated solution** is obtained.



A saturated solution is a solution containing the **maximum amount of solute** at a certain temperature.

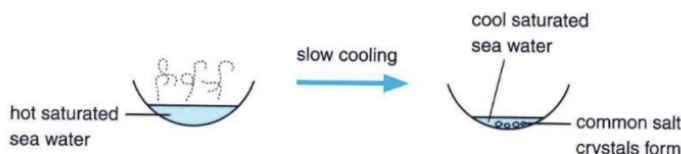
different solubility at different temperature.
→ higher temperature
→ greater solubility

Note:

1. If the solution is not concentrated enough, no crystals will be obtained even after cooling.
2. To ensure the solution is saturated enough for crystallization, we dip a glass rod into the hot solution and take it out. If the immersed end becomes 'cloudy' with few seconds, the solution is saturated.

Step 3: Cool the solution **slowly**. Large sodium chloride crystals are obtained. (**Crystallization**)

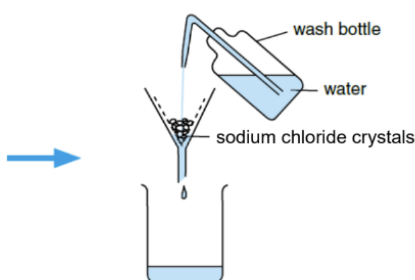
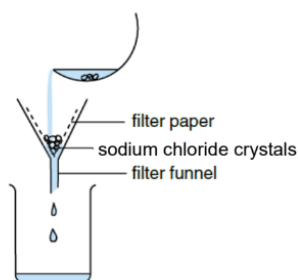
Crystallization is a method of separating a pure soluble solid (solute) from a solution. In crystallization, **pure sodium chloride crystals** can be obtained from a saturated solution of the filtered sea water.



Note:

1. If the solution is cooled quickly, small and less pure crystals will be formed.

Step 4: Filter off the crystals. Wash them with small amount of **cold distilled water** to remove soluble impurities on the surface, and **dry** them with filter paper.



Dry the crystals using filter paper or oven