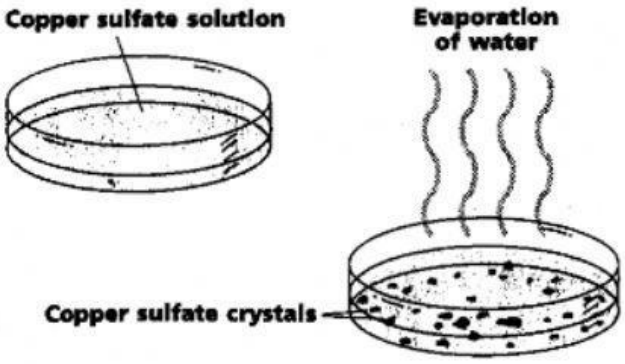
19-3 How can a solution be separated?

Objective ▸ Describe two methods for separating the solute from the solvent in a solution.

TechTerms

- **condensation** (kahn-dun-SAY-shun): change of a gas to a liquid
- **distillation** (dis-tuh-LAY-shun): process of evaporating a liquid and then condensing the gas back into a liquid
- **evaporation** (i-vap-uh-RAY-shun): change of a liquid to a gas at the surface of the liquid

Evaporation A solute can be separated from a solution by evaporation. **Evaporation** (i-vap-uh-RAY-shun) is the change of a liquid to a gas at the surface of the liquid. The molecules at the surface of the liquid gain enough energy to break free of the liquid and move into the air as a gas.



Suppose you wanted to separate copper sulfate crystals from a solution of copper sulfate and water. You could place the solution in a shallow dish and let it stand. After a few days, all the water would evaporate. Crystals of copper sulfate would remain in the bottom of the dish.

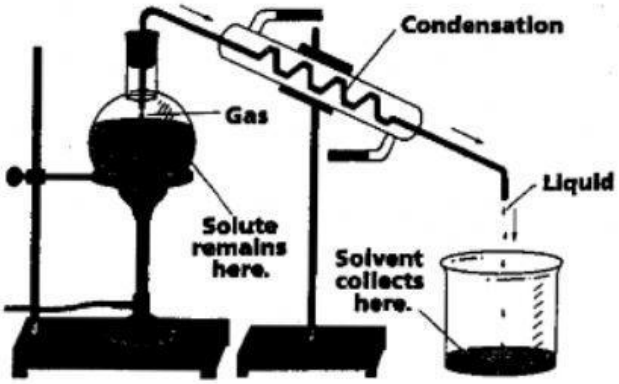
Infer: How could salt be separated from a saltwater solution?

Condensation Have you ever come out of a hot shower to find drops of water on your bathroom mirror? The drops of water are the result of condensation. **Condensation** (kahn-dun-SAY-shun) is the change of a gas to a liquid. Some of the shower water evaporates to form steam. When the steam strikes the mirror, it is cooled. This causes the steam to change back to liquid water.

Define: What is condensation?

Distillation A solution can be separated into its solute and solvent by the process of **distillation** (dis-tuh-LAY-shun). In the process of distillation, a liquid is heated until it evaporates. The gas is then cooled until it condenses back into a liquid.

Evaporation



When a solution is distilled, both the solvent and the solute can be recovered. The solution to be separated is heated. The solvent evaporates and forms a gas. The gas moves through a tube called a condenser. The condenser cools the gas back to a liquid. The liquid drips into a container. The solute remains in the original container. Both the solute and the solvent are recovered.

Identify: What two processes are involve distillation?

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