

Evaporation: fact sheet

Education in Chemistry

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Next time it rains, look at the puddles left behind. Shallow puddles disappear quickly while deeper ones stay around longer. You're watching evaporation in action.

Evaporation is the process where a **liquid** changes to a **gas**. It happens when single particles at the **surface** of a liquid have enough **energy** to break away from the other particles.

Evaporation explained

- Evaporation can happen at any temperature, unlike **boiling**, which only happens at the **boiling point**.
- The higher the temperature, the faster the evaporation.
- Some substances evaporate easily, some evaporate very little. It depends on the strength of the **forces** between particles.

In the bathroom

When you take a shower or bath, the hot water evaporates and produces lots of **water vapour**. You can see the water as it **condenses** on cooler surfaces like windows and mirrors.

Think about how **condensation** appears less in the summer when the room temperature is higher and you're more likely to have the window open.

Did you know ...?

The 'steam' you can see emerging from a boiling kettle is actually tiny droplets of liquid water. Water vapour is invisible.

In the kitchen

When a loaf of bread is baking, the inviting smell is due to evaporation of **flavour compounds** with complex names, such as 2-acetyl-1-pyrroline, that **diffuse** around the house.

And if you fancy some coffee with your toast, you'll enjoy the aroma of 2-furylmethanethiol among others.

Did you know ...?

Evaporation makes sauces taste better. By gently evaporating the water, the flavour compounds left behind become more **concentrated**, so the sauce tastes stronger.

In a pandemic

Surface cleaning is important to prevent us picking up viruses from contaminated surfaces. When you spray door handles and other commonly touched surfaces with disinfectant, they don't stay damp for long.

The layer of liquid evaporates quickly because it's very thin and has a high **surface area** so more of the particles in the liquid are in contact with the air.

Hand hygiene has become more important during the pandemic. Next time you use an **alcohol**-based hand gel, rub the gel all over and give your hands a good shake – how do they feel?

Energy is transferred from our hands to the particles in the gel, allowing the particles to make the transition from liquid to gas. You experience this **energy transfer** as your hands feeling colder.