

## Difference between adsorption and absorption - Primer

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If you're just getting started in HPLC or chemistry, you might come across the terms **adsorption** and **absorption**. They sound similar, but they mean very different things — and understanding the difference is important for interpreting how molecules behave in chromatography.

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### Adsorption – Think “Sticking to the Surface”

- Definition: Adsorption is when molecules stick to the surface of a solid or liquid.
- In HPLC: Water molecules might stick to the surface of a hydrophilic (water-attracting) stationary phase inside the column.
- Key idea: The molecules are not going inside the material — they're just on the surface.

#### Example:

A paper towel **adsorbs** water — the water clings to the surface fibers.

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### Absorption – Think “Soaking In”



- Definition: Absorption is when molecules are taken into the volume of a material — like being soaked up.
- In chemistry: A compound might dissolve into a liquid phase during an extraction.
- Key idea: The molecules are inside the material, not just on the surface.

#### Example:

Your skin **absorbs** sunlight — the energy goes into your skin, not just on top.

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### Easy Way to Remember

Term	Where the Molecule Goes	Can It Be Recovered Easily?	Everyday Example
<b>Adsorption</b>	On the surface	 Yes, often by elution	Water on a paper towel
<b>Absorption</b>	Into the material	 No, not easily removed	Sunlight into your skin

#### Rule of Thumb:

If you can wash it off or elute it — it's probably adsorption.

If it's soaked in or dissolved — it's absorption.

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Understanding this difference is especially helpful in HPLC, where **adsorption** plays a key role in how compounds interact with the stationary phase and how they separate during analysis.

*To put this in layman's terms and as a rule of thumb, with adsorption you can regain the molecule with elution, with absorption, the molecules are not recoverable. Sunlight is absorbed by skin and water is adsorbed by a paper towel.*

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