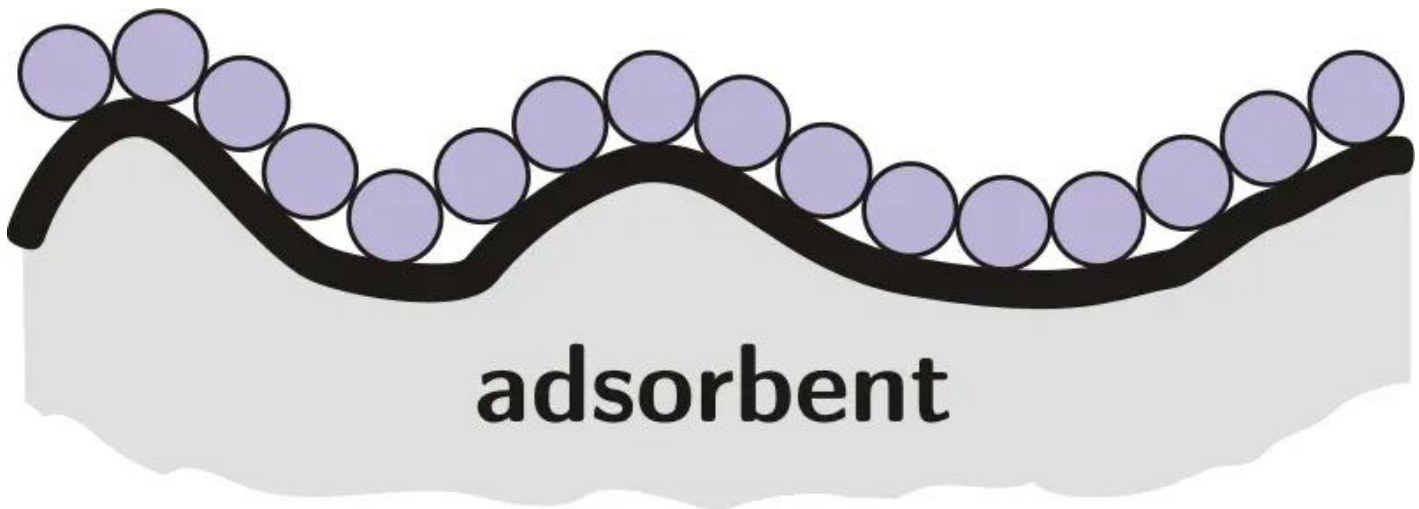


What is Adsorption?

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About Adsorption

- It refers to the **adhesion of atoms**, ions, or molecules from a gas, liquid, or dissolved solid **to the surface of a material**.
- It is considered a **surface phenomenon** that **creates a film of the adsorbate on the surface of the adsorbent** (a solid material, for instance).
- **Materials** that are **used to adsorb** gases or dissolved substances are called **adsorbents**; the **adsorbed molecules** are usually referred to collectively as the **adsorbate**.
- **How Adsorption Works?**
 - Adsorption **depends on surface energy**.
 - **The surface atoms** of the **adsorbent** are **partially exposed**, so they can **attract the adsorbate molecules**.
 - Adsorption may **result from electrostatic attraction, chemisorption, or physisorption**.
- **Characteristics of Adsorbents:**
 - Typically, adsorbents have **small pore diameters** so that there is a **high surface area to facilitate adsorption**.
 - The pore size usually ranges between 0.25 and 5 mm.
 - Industrial adsorbents have **high thermal stability** and **resistance to abrasion**.
 - **Depending on the application**, the surface may be **hydrophobic or hydrophilic**.
 - The adsorbents **come in many shapes**, including rods, pellets, and molded shapes.
 - **Examples** of adsorbents include **Silica gel, Alumina, Activated carbon or charcoal, Zeolites**, Adsorption chillers used with refrigerants, Biomaterials that adsorb proteins, etc.

- Adsorption is a **different** process **from absorption**, in which a **substance diffuses into a liquid or solid to form a solution**.
 - Adsorption phenomena are **operative in most natural physical, biological, and chemical systems**, and adsorption operations employing solids such as activated carbon and synthetic resins are **widely used in industrial applications** and **for the purification of waters and waste waters**.
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Q1: What is electrostatic attraction?

Electrostatic Attractions are interactions between opposite charges. The attraction wants to pull the opposite charges together. Ionic bonds are formed by the electrostatic attractions between ions. Covalent bonds are formed by electrostatic attraction between the nuclei's protons and the shared electron pair. Electrostatic attraction also happens between molecules or atoms. But, it doesn't form a bond. Instead, they interact with each other via partial charges or dipoles.

Source: [Discovery of uranium-contaminated soil purification material without secondary environmental pollution](#)

Source: <https://vajiramandravi.com/current-affairs/adsorption/>

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