

Phase (matter)

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Not to be confused with [State of matter](#).

In the [physical sciences](#), a **phase** is a region of space (a [thermodynamic system](#)), throughout which all physical properties of a material are essentially uniform. Examples of physical properties include [density](#), [index of refraction](#), [magnetization](#) and chemical composition. A simple description is that a phase is a region of material that is chemically uniform, physically distinct, and (often) mechanically separable. In a system consisting of ice and water in a glass jar, the ice cubes are one phase, the water is a second phase, and the humid air is a third phase over the ice and water. The glass of the jar is another separate phase.

Q: Everybody understands things like solid, liquid or gaseous state of substance. We call them solid, liquid or gaseous phases, respectively. This is intuitive but hardly rigorous. Chemists, I'm told, consider a cup of sweetened tea to be a single phase, even when the concentration of sugar at the bottom is maximal and nearly zero at the free surface (no mixing was applied to dissolve the sugar). Is this indeed correct?

A: A phase, or state of matter, is a domain within a many-body system within which relevant physical properties are uniform. Relevant properties may include chemical composition, stoichiometry, and density, which do not reflect how the components are arranged in space. Different domains with the same physical properties are said to be in the same phase even if they differ in such thermodynamically irrelevant parameters as orientation. Thus ice cubes in a glass of water are all in the crystalline phase. So also with magnetic domains in a ferromagnet.

For systems out of equilibrium, the definition of phases and phase transitions is far more varied and complicated.

Binární isomorfní fázový diagram

https://www.youtube.com/watch?v=dAKt_3GQfNs

Eutektický fázový diagram

<https://www.youtube.com/watch?v=1Z17yIm9dMI>

Eutektická struktura

<https://www.youtube.com/watch?v=MufPJhiQKC8>

Video eutektická struktura

Příklady složitých diagramů

https://www.youtube.com/watch?v=JLzJrguM_gI