

Equilibrium partitioning of organic compounds

▼ [Some fundamentals ...](#)

↓ ● [Preliminary note](#)

↓ ● [Introduction](#)

↓ ● [Condensed phase and gas phase](#)

↓ ● **2 condensed phases**

↓ ● [3 phase system](#)

↓ ● [Partitioning between various phases](#)

▶ [Summary and further information](#)

▶ [Self test](#)

▶ [Problems](#)

▶ [Advanced problems](#)

● [FAQ](#)

2 phase system: 2 condensed phases

In a closed bottle that contains water and a vegetable oil, both phases will not mix. Nevertheless, some water molecules will reside in the oil phase and some oil molecules will reside in the water phase. We can say that the oil is saturated with water and the water is saturated with oil or: both phases are in equilibrium with each other with respect to the partitioning of water and oil molecules. Neither water nor oil molecules like being in the other phase. Water molecules like to stay in their own phase because it is energetically unfavorable to give up the many H-bonds that they can form with neighboring water molecules. Oil molecules do not like to enter the water phase because it is energetically unfavorable to disturb the H-bond network of water. That is why both phases do not mix. But temperature causes some molecules to have such a high kinetic energy that they overcome the attraction in their own phase and enter the neighboring phase. Therefore, in equilibrium, some water molecules can always be found in the oil phase although the water molecules gain less interaction energy there than in their own phase.

