Equilibrium partitioning of organic compounds

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Partitioning of a dilute chemical, *i*, between various phases

In most cases, in environmental chemistry we encounter a situation different from those described above: small amounts of pollutants enter the environment either as emissions into the air or dissolved in waste water. In these cases the pollutants do not occur in concentrations that are high enough to form a separate phase. Hence, the partitioning of these pollutants does not occur between the pure phase of these compounds and water or air but only between pre-existing natural phases like water, air, aerosols, biota, humic matter or mineral surfaces. The principles of the equilibrium partitioning remain the same though. If the pollutant molecules had no interactions within other phases then their thermal energy would cause them to distribute evenly between all existing phases. However, every molecule will encounter interactions with neighboring molecules in all phases except the air-phase. The nature of these interactions is discussed in Chapter 4. Here, it suffices to know that the stronger the interactions between the solute and the surrounding phase molecules, the greater the free energy gain from the interaction and hence the higher the equilibrium concentration of the solute in this phase.

