Answer on Question #79595 - Chemistry - Physical Chemistry

Question:

what is the integral and differential enthalpy of dilution

Solution:

The integral enthalpy of dissolution is the change in enthalpy in the process of dissolving a certain (finite) amount of matter in a certain (finite) amount of the solvent. The integral enthalpy of dissolution can be measured, and its magnitude depends on the concentration of the solution. Two values of the integral enthalpies of dissolution have special names and can not be measured, they can only be calculated.

The first enthalpy of dissolution (or enthalpy of dissolution to an infinite dilution) is the change in enthalpy when one mole of substance is dissolved infinitely large amount of solvent.

The total enthalpy of dissolution is the dissolution enthalpy corresponding to saturated solution.

The differential enthalpy of dissolution is referred to as 1 mole. Substance change enthalpy in the process of dissolution of an infinitesimal amount substances in a finite amount of the solvent (or solution) or in the process dissolution of a finite amount of matter in an infinitely large amount solvent (solution).

It is assumed that the concentration of the solution in the initial and final states same. The values of the differential enthalpies of dissolution depend on solution concentration. If we determine the differential enthalpy of dissolution at different concentrations of the initial solution, we obtain a series of differential enthalpy of dissolution. The first term in this series corresponds to enthalpy of dissolution in an infinitely large amount of pure solvent, this The quantity is called the first differential enthalpy of dissolution and coincides with the first integral enthalpy of dissolution. The last member of this series - is the differential enthalpy of dissolution of a substance in a solution that has a concentration infinitely close to the concentration of a saturated solution and is called the last, or theoretical, enthalpy of dissolution.