ENTHALPIC PAIR INTERACTION COEFFICIENTS BETWEEN AMINOPHOSPHONIC ACIDS IN WATER AND AQUEOUS UREA AT 298.15 K

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Aminophosphonic acids are analogs of natural aminoacids. Aminophosphonate molecule consists a constant group NH₂-CH₂-PO₃H₂ and vaneside chains -R which shows different affinities to water and are partly responsible for hydrofobic - hydrophilic properties. The structural analogy of these compounds is due to diverse biochemical activity, displayed especially in agrochemistry - glyphosate (N-(phosphonomethyl)glycine) is one of the most popular herbicide. They compete to active centre of enzymes as result it can inhibit enzymes such as aminotransferases or proteases. Their variety applications include enzyme inhibitors, potent antibiotics, herbicides, and also antitumor medicines. Aminophosphonates also occur in many living organisms, eg. bacteria, protozoa, invertebrates, sea anemones, mussels.

Thus is interesting to research interaction between these compounds and constituent organisms fluids, for example urea. Urea is used to produc-
tion of many fertilizers, its aqueous solutions are used as a protein denatur-
tion factor and it is ingredient of cosmetic products.

In these studies solution enthalpies of series aminoalkanephosphonic
acids (phosphonovaline and phosphonononorvaline) and N-methyl derivatives
(N-methyl-aminopropylphosphonic acid and N,N-dimethylaminopropyl-
phosphonic acid) in water and aqueous urea in 298.15 K have been meas-
ured. Modified McMillan-Mayer theory allows use these data to calculate
enthalpic heterogenous pair interaction coefficients of aminophosphonic
acids – urea molecules.