CHARACTERIZATION OF TOBACCO MOSAIC VIRUES (TMV): A NEW THERMODYNAMIC APPROACH FOR LIQUID PHASE SYSTEMS

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Liquid phase reaction systems account for most of the physicochemical processes involved in research and industrial applications. Most of these systems are based on the behavior of ideal gases developed by Gibbs-Duhem. Changes in the pressure-volume relationship that deviate from the ideality are corrected by a parameter referred as *activity*. We observed that these methods of physicochemical characterization did not provide satisfactory results in non-ideal systems. The use of Gibbs-Duhem equation leads to a loss of correlation between the physical properties of the species involved. Either the assumed volume variations or the energy properties are not satisfactory for liquid phase because they are interdependent. Furthermore, the use of the activity coefficient does not correct this problem; even though there is a good description of one property, all others are lost. The expression of the activity coefficient that provides this correction is generally so complex that generates mathematical constraints to recover the other properties. We developed a new approach to deal the observed physicochemical behavior based on equations for volume changes that were more flexible than the ideal gas equation. We analyzed the effect of pressure combined with urea, pH and temperature on TMV particles using this approach, and more valuable information on dynamic and energetic properties were acquired.