

## Partial Molar Volume of Phenylboronic Acid in Protic Solvents at Selected Temperatures

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Phenylboronic acid is used for treating fungal and bacterial infection. The literature has a lack of thermo-physical data on aqueous solutions of phenylboronic acid and water soluble derivatives. In this work, the apparent molar volume of phenylboronic acid in water, 0.154 M NaCl, 0.1 M HCl, 100% methanol, and %100 ethanol as solvents at (293.15, 298.15, 303.15, 308.15, 313.15, and 318.15) K temperatures and at a pressure of 101.325 kPa were determined from the density data obtained using a vibrating tube Anton PAAR DMA-4500 M density meter. The partial molar volume,  $V_m$ , of phenylboronic acid in different solvents at selected temperatures was evaluated by extrapolating the apparent molar volume versus molality plots to  $m=0$ . In addition, the partial molar expansivity,  $E^\circ$ , the isobaric coefficient of thermal expansion,  $\alpha_\tau$ , the interaction coefficient,  $S_v$ , and the Hepler's constant have also been computed. It is observed that  $V_m$  values are increasing with temperature, and on the other hand,  $S_v$  values are decreasing with temperature for all the solutions. The positive values that are smaller than  $V_m$ , for water and 0.154 M NaCl solutions suggest the dominance of solute-solvent interactions over solute-solute interactions. These interactions are hydrophilic interactions among the molecules in water and coulombic electrostatic and hydrophilic interactions for 0.154 M NaCl solutions while the negative values among the molecules in 0.1 M HCl, methanol, and ethanol indicate hydrophobic interactions. The positive Hepler's constant values and positive partial molar expansivity,  $E^\circ$ , values for the solutions confirm structure promoting tendency behavior of phenylboronic acid in protic solvents.