Equilibrium Surface Tension of 2-Amine-2-Methyl-1-Propanol in an Aqueous Mixture of n-Methyldiethanolamine + Diethanolamine over the Range 303 to 333 K

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Experimental values of the equilibrium surface tension were determined for the aqueous amine mixture formed by n-metyldiethanolamine (MDEA) + diethanolamine (DEA) (32.5 mass % MDEA, 12.5 mass % DEA, and 55 mass % water) as a function of the concentration of 2-amino-2-metyl-1-propanol (AMP). Five different concentrations of AMP (2, 4, 6, 8, and 10 mass %) were studied at the temperatures 303.15, 313.15, 323.15, and 333.15 K. In this work, the pendant drop method was used to determine the equilibrium surface tension. The determined uncertainty for the surface tension results is 0.21 $mN \cdot m^{-1}$.

With the experimental results of the equilibrium surface tension of the aqueous amine mixture formed by MDEA/DEA as a function of the concentration of AMP, values of the surface excess, using the Gibbs relation, the surface area, and the modulus of elasticity of Gibbs were derived to explain the distribution of the molecules. This indicates the degree of packing and/or the orientation of the molecules of AMP adsorbed on the liquid-vapor surface together with the stretching of the surface which will indicate if the system forms or not foam.