**Vapor-Liquid Phase Behavior of the Binary System Hydrogen Chloride + Ethane**

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In many industrially important processes hydrogen chloride may occur as one of the major constituents. However, due to its corrosive nature, hydrogen chloride is not a substance easy to handle in all kind of industrial and experimental facilities. As a consequence, accurate basic data of mixtures with hydrogen chloride as one of the components are very limited.

In the underlying study an attempt was made to use Cailletet equipment to determine phase equilibria in binary mixtures with hydrogen chloride as one of the components. Since in this type of equipment the sample to be investigated is in direct contact with mercury, the occurrence of corrosion problems is not unlikely. Literature is not very explicit about the conditions at which hydrogen chloride may interact with mercury. In order to minimize the possibility of corrosion in the experimental setup, the hydrogen chloride dosing facility was provided with corrosion resisting materials. Moreover, all chemicals used had an extremely low content of water and oxygen. Measurement of the saturated vapor pressure curve of pure hydrogen chloride and comparing the data obtained with the best data known in literature, showed complete agreement.

In addition, the Cailletet equipment was used to investigate experimentally the vapor-liquid phase behavior of the binary mixture hydrogen chloride + ethane. The experimental work was carried out in the temperature region $275 < T/K < 325$ and pressures up to 8.5 MPa were applied. Again, no indication of corrosion could be observed during the course of the measurements. It was found that the binary system hydrogen chloride + ethane shows maximum pressure azeotropy. In addition to the experimental work, equations of state were used to model the experimental data obtained.