

Generalized Phase Loop Determination Algorithm for Multicomponent Mixtures

Diego Ortiz-Vega^S and Diego Cristancho

Chemical Engineering Department, Texas A&M University, College Station, TX, U.S.A.

Gustavo Iglesias-Silva

Departamento Ingeniería Química, Instituto Tecnológico de Celaya, Celaya, Guanajuato, México

Kenneth R. Hall^C

Chemical Engineering Department, Texas A&M University, College Station, TX, U.S.A.

This paper contains an improved, straightforward and easy to implement method for determining phase envelopes of multicomponent mixtures. This technique uses procedures based upon Gibbs minimization, the tangent plane equation and mass balances, which lead to a more efficient algorithm capable of converging closer to the critical point than other conventional algorithms (e.g., *K*-value method). Moreover, all the curves reported correspond to stable points according to the stability analysis suggested by Michelsen et al (2004), which implies a minimization of the tangent plane distance function. Several examples compare the efficiency of our technique to commercial programs that often fail at certain conditions around the critical point, cricondenbar and/or cricondentherm.