Adaptation of the Bubble-Point Method to the HI-I_2-H_2O System

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Concerning the Iodine-Sulfur thermochemical water-splitting process, understanding the properties of the HI-I_2-H_2O system is essential for making good choices of operating conditions and for accurate estimation of thermal efficiency. A new apparatus was developed for determining bubble points of this system at high pressure (up to 4 MPa). Experimental measurements for the HI-I_2-H_2O system are technically difficult because of its corrosiveness. We therefore adapted the bubble-point method to the system. The main components of the apparatus are a cylinder and piston; this simple structure was easily fabricated with a tantalum lining to resist the corrosive environment. At present, trial operations have been conducted to obtain bubble points from the inflection points of curves representing observed pressure as a function of piston displacement. In this presentation, details of the apparatus and a test plan will be described.