

ISO 6145-7:2001, Gas analysis -- Preparation of calibration gas mixtures using dynamic volumetric methods -- Part 7: Thermal mass-flow controllers



This part of ISO 6145 specifies a method for the continuous production of calibration gas mixtures, containing two or more components, from pure gases or other gas mixtures by use of commercially available thermal mass-flow controllers. By adjustment of set-points on flow controllers to pre-determined values, it is possible to change the composition of the gas mixture rapidly and in a continuously variable manner. By selection of appropriate combinations of thermal mass-flow controllers and with use of pure gases, the volume fraction of the component of interest in the complementary gas can be varied by a factor of 1 000. The relative expanded uncertainty of measurement, U , obtained by multiplying the relative combined standard uncertainty by a coverage factor, $k = 2$, is not greater than 2 %. If pre-mixed gases are used instead of pure gases, mole fractions below 10^{-6} can be obtained. The measurement of mass flow is not absolute and the flow controller requires independent calibration. The merits of the method are that a large quantity of the gas mixture can be prepared on a continuous basis and that multi-component mixtures can be prepared as readily as binary mixtures if the appropriate number of thermal mass-flow controllers is utilized. Gas blending systems, based upon thermal mass-flow controllers, and some including the facility of computerization and automatic control, are commercially available. This title may contain less than 24 pages of technical content.

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