

Fully automatic boiling point determination of liquids

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In many modern production processes it is important to know the thermal behavior of a substance under different conditions. Amongst different physical methods boiling point is used to characterize a substance and analyze its properties.

The boiling point (BP) of a substance is the temperature at which the liquid to gas phase transition occurs under normal pressure conditions (1013.25 hPa). It is a substance-specific property that is often used to select an optimal process temperature, suggesting a storage condition, identifying the products and assessing risk in process design [1]. It is also required for Material Safety Data Sheets (MSDS).

A METTLER TOLEDO MP80 system is used to determine the BP of liquids fully automatically. Samples are pipetted into a glass tube and a boiling point capillary is inserted into the instrument and the measurement method is started. As the temperature rises, gas bubbles are formed within the liquid and escape to the surface (Figure 1). The determination principle of BP detection is based on counting the ascending bubbles and is thus univocally defined. With the MP80 very little sample is required; the recommended liquid volume is in the range of 100 μl . Instrument operates across a wide temperature range, from ambient temperature up to 350 $^{\circ}\text{C}$.

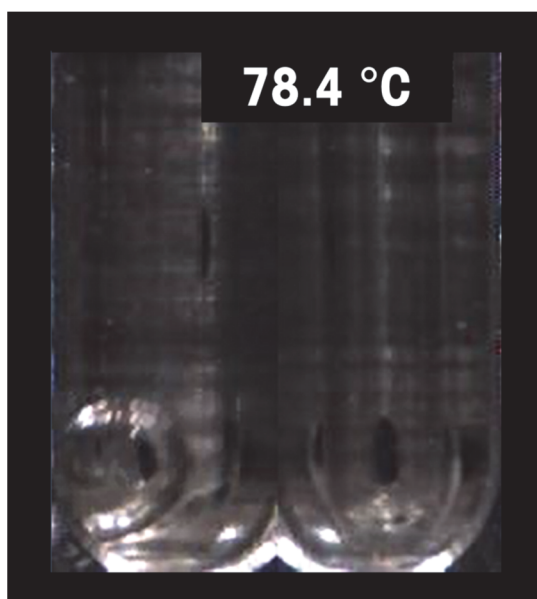


Figure 1: Duplicate, simultaneous boiling point measurement of ethanol.

References:

[1] F. Stoessel, Thermal Safety of Chemical Processes: Risk Assessment and Process Design, John Wiley&Sons (2008)

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