

Surface Tension Effects in Suspended-Level Capillary Viscometers

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A study of the influence of the surface tension of liquid on viscosity measurements with suspended-level capillary instruments has been performed. This study is part of a larger project aimed at the proposal of Diisodecylphthalate (DIDP) as an industrial standard for moderately high viscosity substances. In fact, one of the basic issues when addressing capillary viscometry is the influence of the surface tension on the accuracy of the measurements. However, certified standard reference substances for viscosity are, in general, supplied without any indication of their surface tension. In fact, reference to this issue is made for some calibrated routine viscometers whereby it is claimed that for a limited range of surface tensions [1] no correction should be necessary. Nevertheless, this does not allow the user to perform any correction, if required. Hence, it is our belief that the proposal of DIDP as an industrial standard for viscosity, needs the assessment of the effects of surface tension on the calibration and measurements performed with routine capillary viscometers. A preliminary analysis was presented, together with new surface tension data for DIDP [2] obtained with a pendant-drop-shape analysis method.

In the present work, we use these results together with new measurements performed on two samples of certified viscosity reference materials to assess surface tension effects on routine suspended-level capillaries. This practical study is based on the procedure followed by Bauer and Mehlender [3], and the results are summarized here.

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- [1] SCHOTT-GERATE GmbH, Manufacturer's Certificate for capillary viscometer (DIN 55350, part 18), apparatus n° 1012949, 2002.
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- [3] H. Bauer and G. Mehlender, *Rheologica Acta* **23**, 514 (1984).