Date of Issue: November 2013

Affected Publication: API *MPMS* Chapter 19.4, *Evaporative Loss Reference Information and Speciation Methodology*, Third Edition, October 2012

ADDENDUM 1

Summary of Changes to API MPMS Chapters 19.1, 19.2 and 19.4, page v, in the list under "Chapter 19.4, third edition", add the following:

5) Determination of true vapor pressure. Cautions have been added to section 4.2 of Chapter 19.4 with respect to the use of Reid vapor pressure to determine the stock true vapor pressure, and ASTM test methods D2879 and D6377 have been referenced for directly measuring the stock true vapor pressure.

Section 4.2, item a), add after Equation (2):

The true vapor pressure of refined stocks can also be determined using ASTM D2879[50], particularly for refined stocks that have a vapor pressure below the RVP lower bound of 1 psi. ASTM D2879 allows direct measurement of true vapor pressure at specified temperatures, thereby avoiding any bias or uncertainty that may be associated with the RVP correlations of Equation (1) and Equation (2). Values for the vapor pressure constants A and B may be determined from a regression of the direct measurement data. ASTM D2879 may not be appropriate for mixtures that contain highly volatile components, in that the degassing step of ASTM D2879 may drive these components out of the sample prior to analysis.

Section 4.2, item b), add after Equation (4):

These RVP correlations have a bias that overstates the true vapor pressure of crude oils which are not live at storage conditions, as that term is defined in ASTM D6377[51]. The error is particularly pronounced at the high and low ends of the RVP range, and is less significant for mid-grade crude oils. On the other hand, the RVP method of sample collection and preparation may result in the loss of highly volatile components from samples of live crude oil, thereby resulting in an understatement of the true vapor pressure.

Section 4.2, item b), add after the 2nd paragraph:

For crude oils with a vapor pressure between 25 kPa and 180 kPa at 37.8 °C (3.6 psia to 26 psia at 100 °F), true vapor pressure can be determined directly through ASTM D6377[51]. This method allows direct measurement of true vapor pressure over a range of specified temperatures, thereby avoiding any bias or uncertainty that may be associated with the RVP correlations of Equation (3) and Equation (4). Values for the vapor pressure constants A and B may be determined from a regression of the direct measurement data.

Bibliography, add the following:

[50] ASTM D2879, *Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope*.

[51] ASTM D6377, *Standard Test Method for Determination of Vapor Pressure of Crude Oil: $VPCR_x$ (Expansion Method)*.