

Preliminary Study for the Establishment of Oscillation-Type Density Meter Calibration at NIMT

Wednesday, May 20, 2015 3:00 PM (15 minutes)

Density meters have been employed to measure the density of liquids and used in many areas such as chemical, petroleum, pharmaceutical and beverage applications. The advantages of density meters over other density measurement devices are their fast measurement, high accuracy and little sample needed. Although high accuracy is one of their major features, the density meters need regular calibration to ensure the accuracy of their measurement results. National Institute of Metrology (Thailand), NIMT, studied the calibration of density meters in accordance with the international standard ISO 15212-1. In this paper, the studied technique was applied to the calibration of oscillation-type density meters. The calibration performed at the temperature of 20 °C was traceable to SI unit by using traceable standard liquids with known densities. Three types of the liquids, whose densities are within the density measuring range of 700-1600 kg/m³, were employed. Those liquids were lube oil, water and sodium bromide in water. The calibration results were presented in terms of the deviations between the measured densities and the certified densities reported in certificates of standard liquids. Also the sources of measurement uncertainty were proposed and calculated. The calibration results showed acceptable deviations, which were within the maximum permissible errors of density meters under test.

Primary author: Dr HIRUNYAPRUK, Chompoonoot (Mechanical Metrology Department, National Institute of Metrology (Thailand), Pathumthani, THAILAND 12120)

Co-authors: Mr PLAINDITH, Narongsak (Mechanical Metrology Department, National Institute of Metrology (Thailand), Pathumthani, THAILAND 12120); Ms SUKHON, Rungsiya (Mechanical Metrology Department, National Institute of Metrology (Thailand), Pathumthani, THAILAND 12120)

Presenter: Dr HIRUNYAPRUK, Chompoonoot (Mechanical Metrology Department, National Institute of Metrology (Thailand), Pathumthani, THAILAND 12120)

Session Classification: Instrumentation, Metrology and Standards

Track Classification: Instrumentation, Metrology and Standards