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Press Release

Nippon Instruments Corporation Publishes Method for Measurement of Total Mercury in Crude Oil Using Direct Mercury Analysis

September 7, 2017 – Osaka, Japan. Nippon Instruments Corporation ([NIC](#)) has announced the publication of a new application report describing the analysis of crude oil for mercury levels using atomic absorption spectroscopy. NIC Application Note MA-3A-CA-101 demonstrates the performance of the MA-3000 direct thermal decomposition mercury analyzer and includes complete information about sample preparation, calibration and measurement. The method complies with [US EPA Method 7473](#), *Mercury in Solids and Solutions by Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry*, and [ASTM D-7623-10](#), *Standard Test Method for Total Mercury in Crude Oil Using Combustion-Gold Amalgamation and Cold Vapor Atomic Absorption Method*.

Mercury levels in crude oil can vary widely, both between and within reservoirs and geographical areas. Detectable mercury components of crude oils include a variety of compounds that can exist in soluble, insoluble, gaseous, solid and liquid states. While the average mercury levels found in crude oil do not appear to present an environmental hazard, the refining process tends to concentrate and collect the mercury components and produce mercury-laden airborne emissions, petroleum products and waste products. Furthermore, the US EPA has estimated that US petroleum refineries are responsible for approximately 11 tons of mercury release annually.

In addition to the environmental concerns, mercury is detrimental to the refining process through amalgamation with other metals, poisoning of catalysts, and liquid metal embrittlement. Because mercury is dangerous to both natural ecosystems and humans, as well as detrimental to refining equipment, it is necessary to accurately quantify total mercury in crudes to prevent both mercury poisoning and damage to the refining infrastructure.



**NIC MA-3000 Direct Thermal
Decomposition Mercury Analyzer**





For the analysis described in the report, calibration was performed using certified aqueous ionic-mercury standard solution diluted to the required concentration. Measurement was performed by the NIC MA-3000 analyzer, a dedicated direct mercury analyzer that selectively measures total mercury by thermal decomposition, gold amalgamation and cold vapor atomic absorption spectroscopy, on virtually any sample matrix. The instrument was designed to deliver rapid results without elaborate, time-consuming sample preparation requirements. The results indicate that the MA-3000 analyzer measures mercury in crude oil samples with accuracy and precision.

A copy of this report may be requested at shar-nic@rigaku.co.jp

About Nippon Instruments Corporation

Nippon Instruments produces a broad line of Hg monitors suitable for surveying for vapor-phase elemental mercury in air, and elemental and mercury compounds including methylmercury, in gases, liquids and solids. Materials analyzed include fuels – coal, lignite, crude oil, natural gas; liquids such as waste, drinking and river water; incinerator stack gases; animal products; human tissue and blood and solid waste streams.

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