

**DETERMINATION OF MERCURY AND 22 OTHER METALS IN HYDROCARBON MATRICES  
AT TRACE LEVEL CONCENTRATIONS USING A NOVEL DIGESTION METHOD**

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An accurate, precise method for monitoring mercury and other trace metals in a hydrocarbon matrix, such as natural gas condensate or crude oil, is vital. The trace metals affect the quality and ultimately the sale price of the hydrocarbon, due to the negative impact that trace metals can have on the processing equipment and the environment. The analytical methods for determining these metals at low to sub-ug/L levels are well established. The problems occur with the digestion techniques. A US EPA report showcased the results from 3 analytical techniques for mercury. Two of these techniques, thermal combustion and chemical digestion resulted in exemplary results. However these techniques are suitable for only mercury analysis. The thermal technique combusts the oil sample and specifically detects the mercury in the combustion products. The chemical digestion method uses bromine mono-chloride to digest the hydrocarbon matrix and oxidize the mercury. The resulting total dissolved salts can interfere with mercury detection and render the low level detection of other metals useless. Frontier has developed a digestion technique for hydrocarbons that uses nitric acid and a high-pressure washer to produce a clean sample matrix that can be interrogated by many analytical techniques.