

Application Memo

Water Determination in Petroleum products (2)

[Engine oil]

Industry	:	Petrochemicals
Instrument	:	Karl Fischer Moisture Titrator
Measurement method	:	Volumetric titration /Indirect method
Standards	:	JIS K 0113, ASTM E 203, ISO 760

1. Overview

The moisture in engine oil can be determined by the Karl Fischer titration method (Volumetric) in accordance with “JIS K 0113 ('92)—General rules for methods of potentiometric, amperometric, coulometric, and Karl-Fischer titrators.”

There are so many kinds of petroleum products made from the base oil. The lubricating oil like the engine oil, motor oil or hydraulic oil contains additives, which undergo side reaction in Karl Fischer titration. Moisture of engine oil or the like is normally evaporated at nearly 150°C by an evaporator which is designed for various oil samples, and is carried over to the titration vessel by inert gas. Use the solvent of a 1:1 mixture of Methanol and Ethylene glycol or commercially available Dehydrating solvent ME.

2. Apparatus

Main unit	:	Karl Fischer moisture titration volumetric system
Option	:	Evaporator for oil

3. Reagents

Titrant	:	Composite 2 (made by RdH)
Solvent	:	Dehydrating solvent ME (made by Hayashi)

4. Example

—Measurement results—

Sample	Sample size (g)	Dehydrating solvent	Evaporation temperature (°C)	Water content	
				(mg)	(%)
Engine oil	4.416	Dehydrating solvent ME	150	1.72	0.039

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