

# Measuring moisture in n-methyl-2-pyrrolidone (NMP)

Applied Analytics Application Note No. AN-061



## Application Summary

Analytes:	<b>moisture</b>
Detector:	<b>OMA-InGaAs Process Analyzer</b>
Process Stream:	<b>n-methyl-2-pyrrolidone (NMP)</b>
Typical Measurement Range:	<b>0-10%</b>

## Introduction

N-methyl-2-pyrrolidone (NMP) is commonly used in oil refineries as a solvent. According to Bushnell et al. (1976) NMP solvent is for extracting aromatic hydrocarbons from mixtures that contain aromatic and non-aromatic hydrocarbons. This is specifically useful in the purification process of lube oil, as undesirable aromatic content affects the viscosity of the oil. Other solvents, such as phenol and furfural, are also used for this purpose. However, NMP is considered superior because water does not form an azeotrope with NMP, as it does with phenol or furfural. This means that after the extraction is complete, the water can be separated from the NMP by simple distillation (Bushnell et al.,1976).

Unfortunately, NMP is highly hygroscopic. This is considered a disadvantage. Bushnell et al. (1976) clarify that while it is desirable to have some water content present in the NMP for the extraction process, characteristics like solvent power and solvent/oil miscibility of NMP do change as water is added to it. This is an important point to consider because the NMP used in the extraction process of hydrocarbons is recovered and re-used. Although the optimal water content in the NMP differs depending on the type of lube oil and its wax content, the typical water content is 2-4%, but never more than 10% by volume (Bushnell et al.,1976).

The OMA-300-InGaAs Process Analyzer provides a continuous measurement based on an infrared spectroscopy technique and has been field proven to be successful in measuring water content in the background NMP with a range of 0-10% by volume.

## System Benefits: OMA-InGaAs Process Analyzer

- » Continuously measures chemical concentrations in a liquid or gas process stream
- » Totally solid-state build with no moving parts — modern design for low maintenance
- » Ultra-safe fiber optic design with dedicated sample flow cell — no sample fluid in analyzer enclosure
- » Decades of field-proven performance in the world's harshest industrial environments

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OMA-300-InGaAs Process Analyzer

## Further Reading

Subject	Location
OMA-300-InGaAsProcess Analyzer Data Sheet	<a href="https://aai.solutions/documents/AA_DS001N_OMA300_InGaAs.pdf">https://aai.solutions/documents/AA_DS001N_OMA300_InGaAs.pdf</a>



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