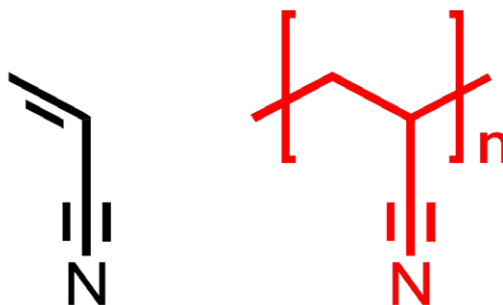


Measuring MeHQ (Polymerization Inhibitor)

Applied Analytics Application Note No. AN-002



Application Summary

Analyte: **hydroquinone monomethyl ether (MeHQ)**

Detection Technology: **OMA-300 Process Analyzer**

Process Stream: **acrylonitrile**

Zero Fluid: **air**

Typical Measurement Range: **0-100 ppm**

Introduction

Polymerization inhibitors are chemicals which stabilize reactive monomers and prevent spontaneous polymerization. If too little inhibitor is added to a reactive monomer, polymerization can occur in pipes or vessels and require mechanical removal. On the other hand, if too much inhibitor is added, the final product may have difficulty polymerizing at the intended stage.

Monitoring hydroquinone monomethyl ether (MeHQ) in Acrylonitrile

MeHQ is usually added as an inhibitor to acrylonitrile (a precursor to polyacrylonitrile fibers for the textile industry). The concentration of MeHQ in the monomer needs to be regulated to avoid spontaneous polymerization (to polyacrylonitrile) as well as waste of MeHQ.

MeHQ has a distinct UV absorbance curve which allows the OMA system to easily monitor its real-time concentration. The full-spectrum analysis is critical for differentiating MeHQ absorbance from other absorbing impurities in the sample.

The OMA continuously outputs the MeHQ reading to the plant's main computer, providing new measurements at 1-5 second intervals for extremely tight process control.

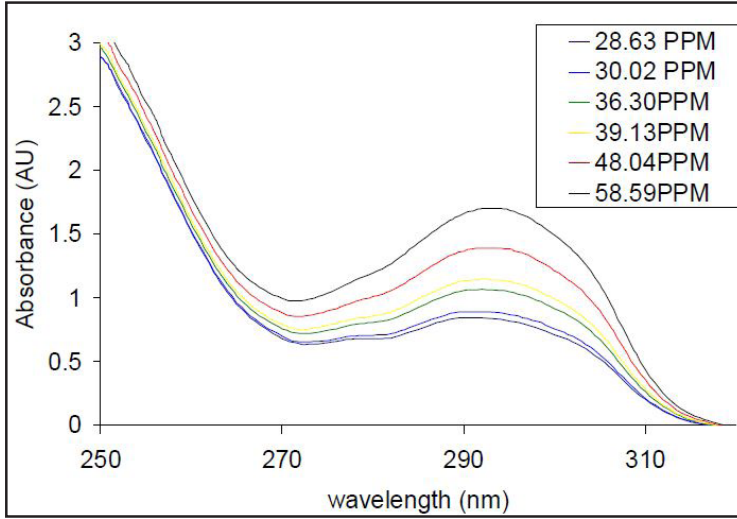
Zeroing the system on pure acrylonitrile is highly impractical due to storage difficulty. Since water mixing with acrylonitrile leads to coating and miscibility effects, water is also not a zeroing option. Air has proven to be an effective and practical zeroing fluid when used with a proper sampling system that minimizes bubble formation.

Measuring MeHQ (Polymerization Inhibitor)

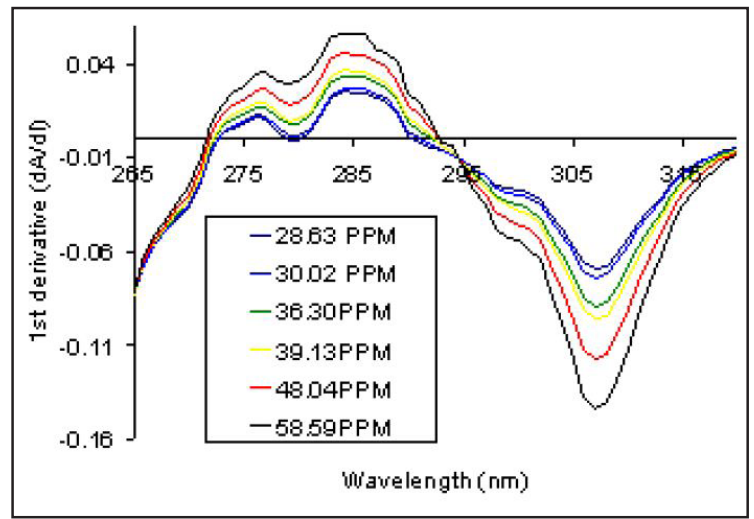
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Absorbance Spectra of MeHQ in Acrylonitrile

These spectra were taken by the OMA-300 on calibration standard mixtures of MeHQ in Acrylonitrile:

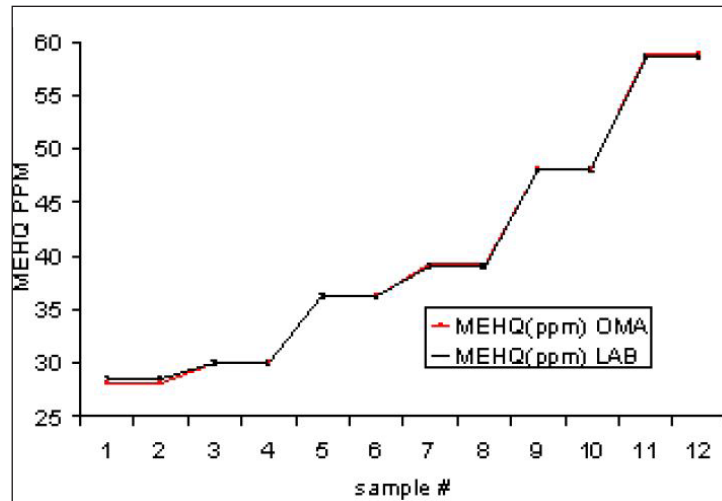


Absorbance Spectrum of MeHQ in Acrylonitrile



1st Derivative of Absorbance Spectrum of MeHQ in Acrylonitrile

The OMA readings on calibration standards correlate extremely well with lab readings:



Measuring MeHQ (Polymerization Inhibitor)

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The specifications below represent performance/build of the OMA-300 Process Analyzer in a typical MeHQ application.

For technical details about the OMA-300 Process Analyzer, see the data sheet:

https://aai.solutions/documents/AA_DS001A_OMA300.pdf

All performance specifications are subject to the assumption that the sample conditioning system and unit installation are approved by Applied Analytics. For any other arrangement, please inquire directly with Sales.

Subject to modifications. Specified product characteristics and technical data do not serve as guarantee declarations.

Application Data	
Performance Specifications	
Accuracy	hydroquinone monomethyl ether 0-100 ppm: ± 0.22 ppm

Measuring MeHQ (Polymerization Inhibitor)

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Revised 04 February 2020

Further Reading

Subject	Location
OMA-300 Process Analyzer Data sheet	https://aai.solutions/documents/AA_DS001A_OMA300.pdf
Advantage of Collateral Data Technical Note	https://aai.solutions/documents/AA_TN-202_CollateralData.pdf



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