

PROCESS RAMAN

Improved product quality and consistency in hypochlorous acid manufacturing

WHAT IS RAMAN?

Raman spectroscopy is an optical analysis technique that measures the vibrational properties of molecules. Raman has revolutionized process analysis with its high-resolution compositional data, linear response to concentration, non-destructive sampling, ability to measure samples in real-time, and NO sampling system.

WHY RAMAN?

Raman spectroscopy gives hypochlorous acid (HClO) manufacturers greater visibility and control of their production processes. When applied in HClO production, Raman ensures more accurate concentrations, formulation safety, and product stability through advanced online control of pH and purity levels.

Compared to auto-titration, the industry's preferred analytical method, Raman spectroscopy is reliable, reduces downtime, and cost as it does not require consumable reagents or constant maintenance.

A MarqMetrix® All-In-One Process Raman spectrometer offers a superior analysis and does not require a scientist to operate.



MarqMetrix® All-In-One Raman System

RAMAN VS. AUTO-TITRATION

	RAMAN SPECTROSCOPY	AUTO-TITRATION
Analysis Time	Seconds	Minutes
Ease of Use	Yes	No
Sample Prep Required	None	Sample prep is required
Calibration	No; Factory-calibrated	Yes; Yearly maintenance
Setup Time	15 mins	1hr+
Scientist Required	No	Yes
Cost of Ownership / 10 years	\$100,000	\$450,000

TAKEAWAYS

- **A Raman spectrometer is easy to install:**
No sophisticated sampling system, carrier gas or consumables required
- **Affordable with a low capital investment**
- **Zero ongoing operating expenses:**
 - No reagents required for operation
 - No weekly/monthly/quarterly/yearly maintenance by an analyzer technician
 - Ultra stable solid-state device with no moving parts
 - MTTF for key components >10 years
- **Rapid analysis:**
Results in seconds, not minutes
- **Uptime better than 99%:**
Designed to analyze 24/7/365 with no intervention by analyzer techs, and no Ph.D. scientists required

For more information contact:

206-971-3625



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RAMAN IN ACTION: MEASURING HClO WITH RAMAN APPLICATION NOTE

A MarqMetrix All-In-One (AIO) Raman System, combined with a stainless steel immersion Process BallProbe®, can accurately and quickly identify HClO concentrations and purity at extremely low concentrations. Raman spectroscopy can also identify the presence of NaClO, the concentration of HClO, and determine whether the solution is too acidic (presence of chlorine).

Method:

- 14 samples of HClO with different dilutions were analyzed by a MarqMetrix All-In-One, using an immersion TouchRaman® BallProbe with an interchangeable InterXc fiber head
- 3 blind unknown samples were used for validation (commercially available samples)
- One-minute total acquisition time per sample

Conclusion:

A MarqMetrix Raman spectrometer is an effective, accurate, and precise analyzer for the measurement of HClO over a range from 0-450ppm. The MarqMetrix All-In-One Process Raman system was also proven capable of measuring samples with high chlorine content. The AIO can successfully measure both the presence of HClO and the presence of additional chlorine species. This study demonstrates that the Raman AIO system is a fast and accurate analyzer for hypochlorous acid purity.

LEARN MORE ABOUT THE ALL-IN-ONE >

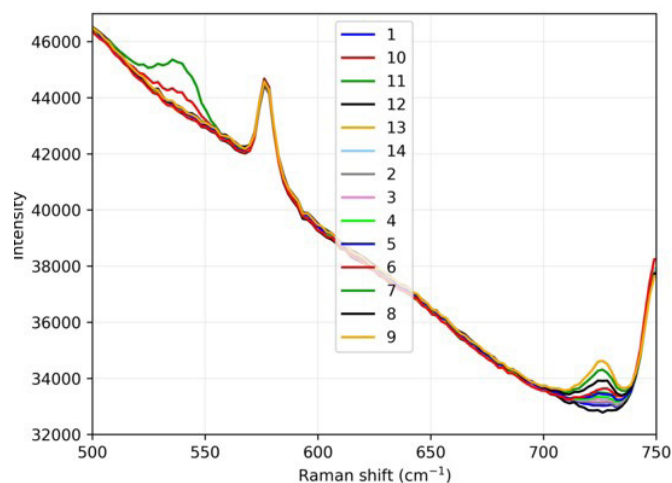


MARQMETRIX®



FM 705363

PLS Calibration Model for HClO



MarqMetrix® Immersion Process BallProbe®

