

PeCOD[®] ANALYZER

✓ "Optimized" TOC



WHO IS MANTECH?

Manufacturer of laboratory, online and portable analyzers for water, wastewater, soil, food and beverage analysis.

*Mission to generate the **highest quality results** in the **shortest amount of time** with the goal of enabling our customers to have significant **positive economic and sustainable impacts** on their businesses and communities.*



TRUSTED & PROVEN GLOBALLY



Rhodia



> 3,500 ANALYZERS

> 50 COUNTRIES

> 670,000 SAMPLES/DAY

> 210,000 ANALYZERS

> 20 COUNTRIES

> 3,200 ANALYZERS

PATENTED TECHNOLOGY

Core technology is the peCOD® sensor consists of:

- UV-activated nanoparticle [TiO₂](#) (titanium dioxide) photocatalyst
- Coupled to an external circuit

Powerful oxidization potential ensures:

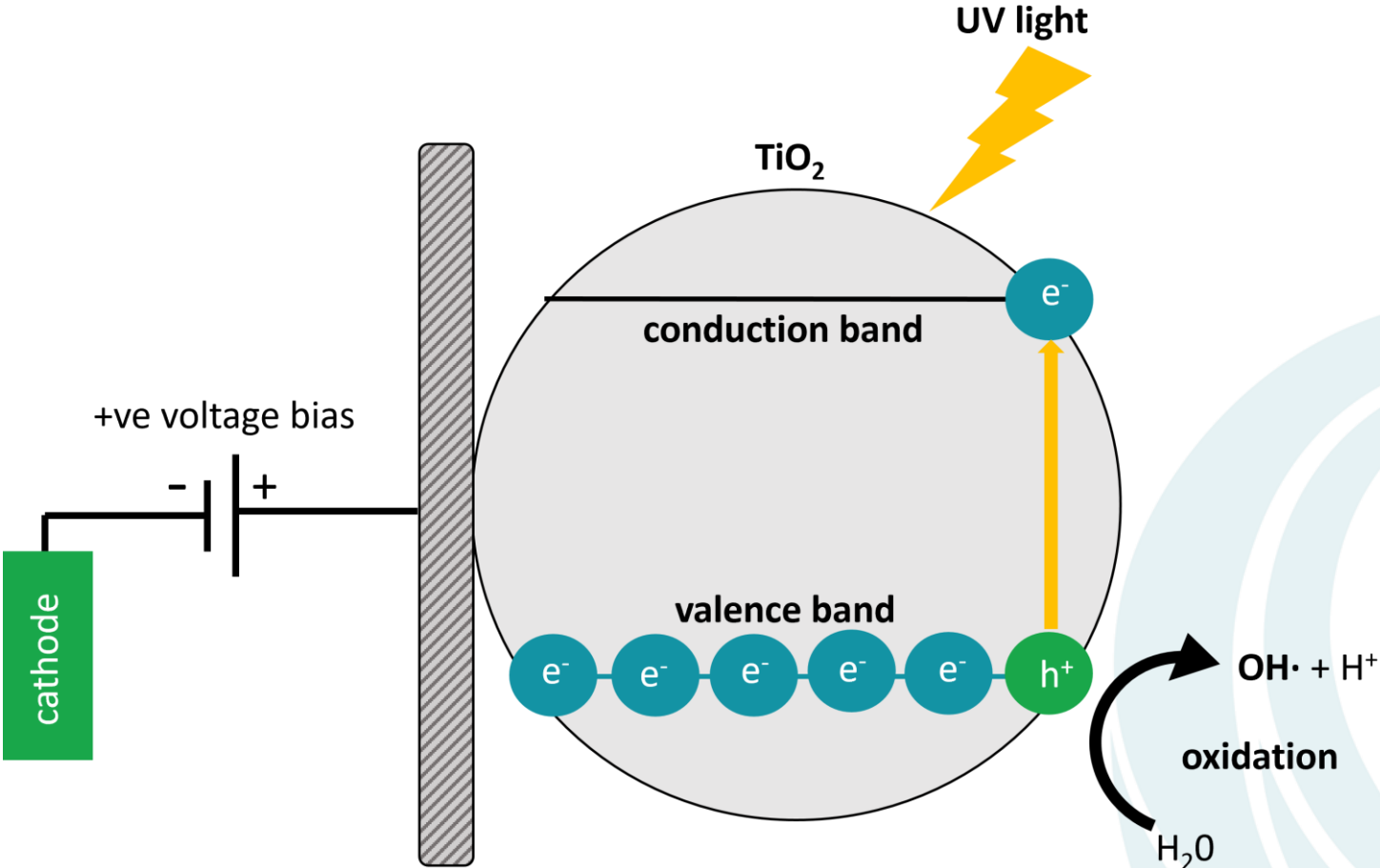
- Rapid results – **ONLY 10-minutes!**
- Complete oxidization of virtually all species
- A true empirical measure



Manufactured at MANTECH-sponsored Nano and Micro Systems Lab



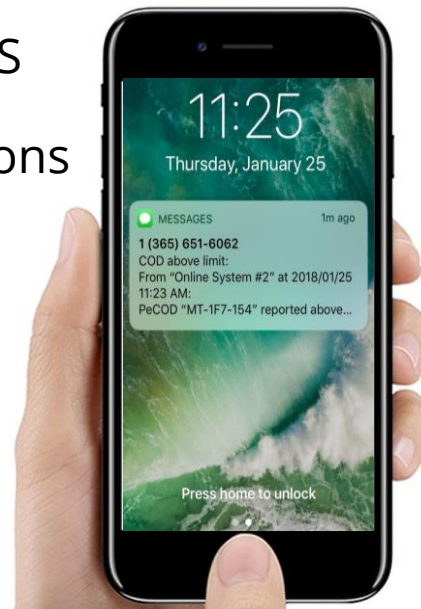
PECOD® | A NANOTECHNOLOGY BASED APPROACH



MANTECH PRO™ SOFTWARE

Smart lab automation software designed by MANTECH

- ✓ Customizable shortcuts
- ✓ Displays real time analysis results
- ✓ Optimized Win10
 - Keep updates & virus protection turned on – *IT dept. love it!*
- ✓ Easily reference data & import/export to LIMS
- ✓ Email functionality to send alerts & notifications
 - Get results anywhere you are to protect public health



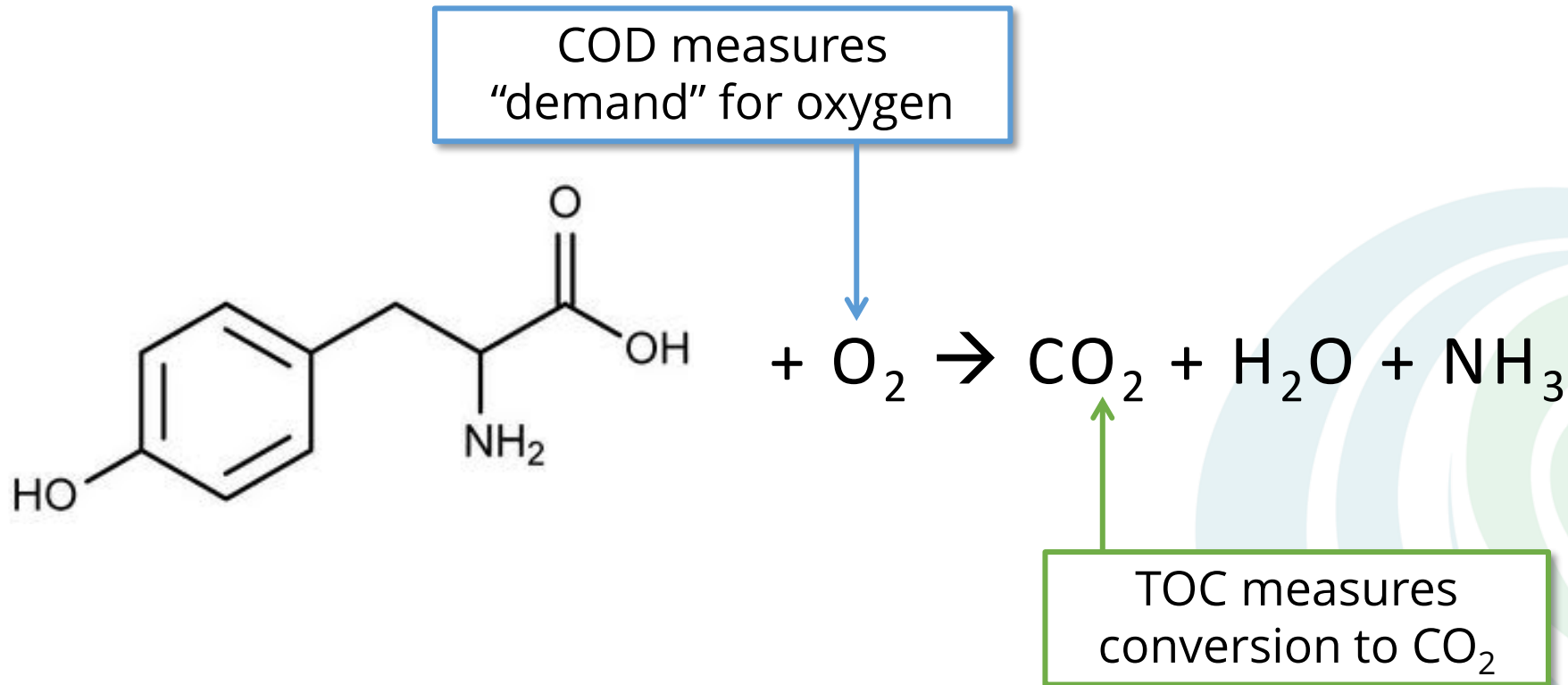
TOC vs. UV254 vs. PeCOD®

"TOC on its own sheds no light on the oxidizability of the measured carbon or the amount of oxygen needed for its biodegradation." - HACH

*"UV254 has a bias towards aromatic organics"
- UV254 Manufacturer*

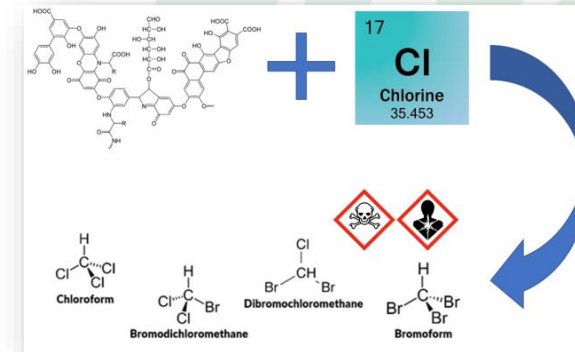
PeCOD® measures the chemical reactivity and associated oxidative changes in Natural Organic Matter (NOM). As a result, it is more sensitive than TOC and UV254 to changing NOM concentrations in source and treated drinking waters.

CHEMISTRY OF COD & TOC



WHAT IS NOM?

- A critical target for drinking water treatment associated with;
 - Taste, odour, colour issues
 - Coagulant, oxidant demand
 - DBP precursors
- Tools for bulk NOM estimation: DOC, TOC, UV254, SUVA
- NOM compounds are known to react with common disinfectants to produce harmful and potentially carcinogenic disinfection by products (DBPs) such as:
 - Trihalomethanes (THMs)
 - Haloacetic acids (HAA)



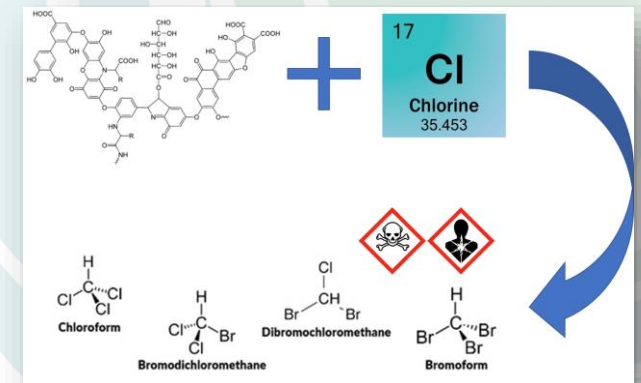


Health
Canada

GUIDANCE OF NOM IN DRINKING WATER

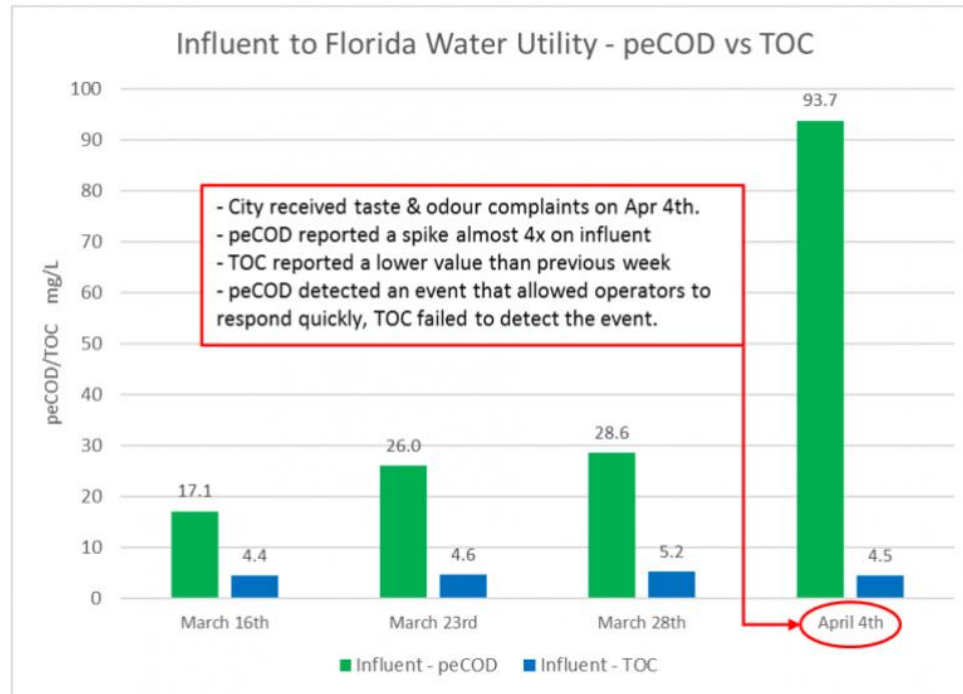
“Historically, the **chemical oxygen demand** test method (using potassium dichromate) was **not sensitive enough for drinking water** (Rittman and Huck, 1989). **More sensitive methods** have since been developed. One involves using **potassium permanganate*** as the oxidant [ISO 8467]; the other is a **photoelectrochemical oxygen demand (peCOD) method** using UV activated titanium dioxide as the oxidant (Zhao et al., 2004; ASTM, 2017).”

- Routine monitoring NOM concentration helps determine most effective treatment option to:
 - Remove NOM
 - Decrease its reactivity to form (harmful and potentially carcinogenic) DBPs
 - Reduce its potential to contribute to lead and/or copper corrosion
 - Produce biologically stable water for distribution
 - Improve color, smell and odor



PECOD® CUSTOMER: DRINKING WATER UTILITY

CASE STUDY: PECOD® IS MORE SENSITIVE THAN TOC



peCOD vs. TOC on Influent to Florida Water Utility WTP

CITY RECEIVED TASTE & ODOR COMPLAINTS ON APR. 4TH

PECOD®

TOC

Results = 4x spike on influent

Results = Lower value than previous week

Detection: Passed

Detection: Failed

ALLOWED OPERATORS TO RESPOND QUICKLY!

ONE TECHNOLOGY, MULTIPLE CONFIGURATIONS



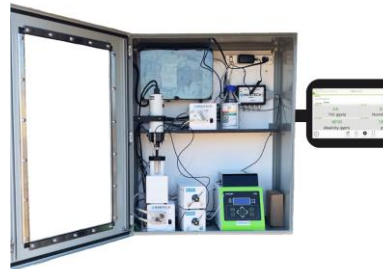
BENCHTOP



AUTOMATED



PORTABLE



ONLINE

ONLINE SOLUTIONS

- Full autonomous control
- Sampling every hour or at user-selected frequency
- Automated calibration and QC checks
- Sends emailed results and alerts for reagent and consumable replacements
- View past and current results in user-friendly software
- Export reports as CSV files through Modbus TCP



AVAILABLE PARAMETERS:

- ✓ PeCOD®
- ✓ pH
- ✓ Alkalinity
- ✓ Fluoride
- ✓ ...and more

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