MANTECH

OPTIMIZE YOUR RESULTS. PROTECT OUR ENVIRONMENT.

Automated Permanganate Index (PI)

Conforming to ISO 8467

Measuring Oxidizability for Source & Drinking Water

Permanganate Index – an important parameter for source and drinking water quality assessment

Due to factors related to climate change, governments around the world, especially the European Union, have recognized the importance of measuring permanganate index (also known as oxidizability) in source and drinking water monitoring. Permanganate index (PI) involves the determination of oxidizability, also known as oxygen (O_2) demand, by potassium permanganate (ISO method 8467). It is the mass concentration of oxygen equivalent to the amount of permanganate ion consumed when a water sample is treated with that oxidant under defined conditions.

"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)" (Health Canada, 2020).

MANTECH's Permanganate Index (Oxidizability) Analysis Procedure:
1. Stir sample to ensure homogeneity
2. Pipet 25 mL of sample volume to water jacketed analysis vessel
3. Add 5mL of sulfuric acid
4. Mix solutions
5. Heat sample to ≈95°C in water jacketed analysis vessel
6. Leave heating for 10 mintues
7. Add 5mL of potassium permanganate volumetric solution
8. Wait 10 minutes for reaction
9. Add 5mL of the sodium oxalate standard volumetric solution
10. Titrate whilst hot with potassium permanganate volumetric solution
11. Drain analyzed solution and rinse needle, stirrer and internal sample transfer tube

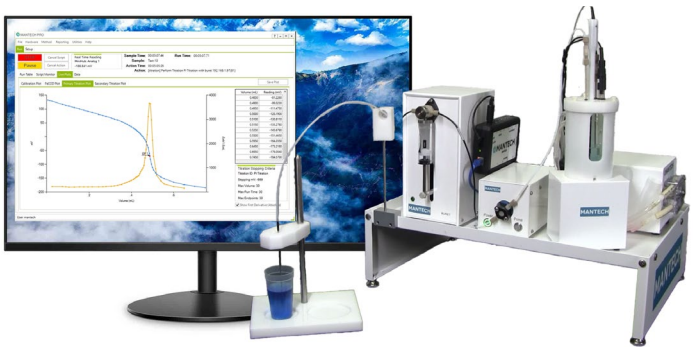
Water Jacketed Vessel

Permanganate Index (PI)
MANTECH Automated Solutions

Depending on your desired level of automation, MANTECH provides a variety of options that conform to the permanganate index ISO method 8467. Available with MANTECH's newest MT Series models including new autosamplers, intelligent pumps and software, class A automated pipette, and more...

MT100 – Multiple Samples

- Free pour samples, load rack and press 'START'
- LOWEST COST PER SAMPLE
  - Smallest sample volume (less reagents)
  - Quickest analysis time
- Software controls all analysis procedures
  - Automated pipetting
  - Precise 97,000+ step buret drive
  - Dynamic intelligent rinsing (no cross contamination)
  - X, Y, Z autosamplers



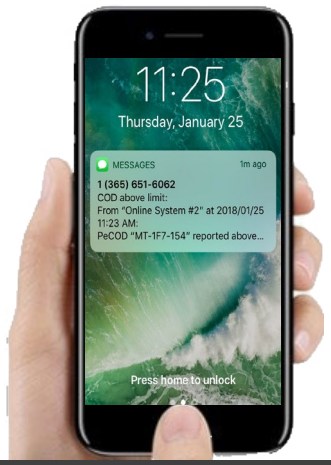
MT5 – Single Sample

- Free pour sample, place sample in load position and press 'START'
- Software controls critical analysis procedures
  - Precise 97,000+ step buret drive
  - Accurate electrochemical measurement
  - Confirmed clean probes (no cross contamination)

NEW MANTECH Pro Software

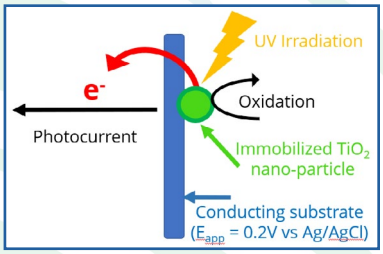
All MT Series environmental analyzers are controlled by MANTECH Pro software.

- Designed for WIN10 & WIN11 OS Pro
  - Run all security features concurrently
- Automated email feature based on user defined events
  - i.e., immediate high PI result notification to protect public health
- Smart devices with bi-directional (hardware-software) communication
  - All ethernet/IP or USB connected
- Full import/export LIMs capability



Alternative Rapid Oxidizability
by PeCOD® Method

The ISO method for permanganate index (PI) requires hazardous reagents and complicated as well as time consuming analysis. The safe, simple and quick PeCOD® analyzer provides an alternative to the permanganate method in EU directive 2020/2184. This revolutionary patented nanotechnology uses the powerful oxidizing potential of UV-illuminated titanium dioxide (TiO2) to measure oxidizability. As a result, it is more sensitive than TOC, which is often used as simplified and non-hazardous surrogate for PI.



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

PeCOD® benchtop, portable, or online oxidizability analyzer.

Coupled with the MT Series for compliance purposes or used independently, the non-hazardous and easy-to-use PeCOD® analyzer can be trusted in the hands of operators. Not only does the analyzer free up laboratory technician's time, rapid results allow for effective treatment optimization that impacts public health. With a correlation of >0.97, this method is proven to be a reliable, safe and green solution.

5-MINUTE ANALYSIS TIME | **SAFE & SIMPLE CHEMISTRY** | **STRONG CORRELATION** | **SUSTAINABLE IMPACT**

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