



Graphite-based Free Chlorine Sensors greatly improve response time, allow for real time measurement and are low cost.

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Patents pending.

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Prototype constructed and tested.
Data is available upon request.

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Low-cost Graphite-based Free Chlorine Sensor

Abstract

Water disinfection is directly responsible for a rapid drop in human illness caused by microorganisms. Chlorine is widely used as a disinfectant in water treatment, where the dosage is dependent on the characteristics of the influent water and the desired residual levels within the municipal piping to ensure safe, clean drinking water arrives at the tap.

Unfortunately, high concentrations of free chlorine are toxic to humans. As a result, there is a desire to ensure that the free chlorine levels are within acceptable ranges to maintain a proper residual during transport to the household and but not high enough to negatively impact human health.

Current methods for the detection of free chlorine use exotic and expensive materials or have the undesirable characteristic of leaching hazardous materials into the water supply. The current standard method for measuring free chlorine is based on a colorimetric method which does not allow for real time sensing.

This technology employs a method of detecting free chlorine using a graphite-based electrode which can be modified from inexpensive and readily available sources, such as pencil graphite. As it is a chronoamperometric measurement system, it is fully electronic and allows for dynamic real-time sensing, with low hysteresis and fast response times, providing a significant improvement over the existing methods.

Applications

- Drinking water and wastewater treatment
- Chlorine monitoring in appliances and filters
- Recreation centers, public swimming areas, spas and pools

Benefits

- Fast response times and low hysteresis
- Inexpensive fabrication of sensing electrodes
- Selectivity towards free chlorine over chloride
- No leaching of hazardous compounds into waterways or streams