Measuring Peracetic Acid with the SL1000

What is Peracetic Acid?

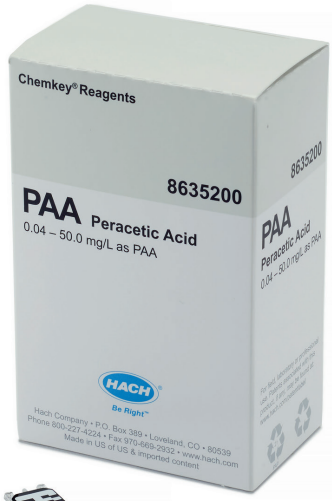
Peracetic acid ($C_2H_4O_3$), also known as peroxyacetic acid or PAA, is produced by a reaction between acetic acid and hydrogen peroxide. PAA is usually produced in concentrations of 5-15% and is a powerful oxidant, more effective than chlorine and chlorine dioxide, and is very soluble in water.

Application temperature and pH are important in PAA's effectiveness as a disinfectant. For optimal disinfection, the pH should be kept neutral at 7 and the temperature kept above or around 25°C (room temperature). Peracetic acid by-products after oxidation are non-toxic (acetic acid, oxygen and water), allowing for high PAA concentration doses for antimicrobial disinfection.

Peracetic Acid Applications

Peracetic acid is used for sanitation and sterilization in many food and beverage applications like brewing and winery bottling, fresh produce, dairy/cheese processing, meats, seafood and poultry. Both the food product and processing equipment can be sanitized with PAA. Other industrial applications include medical facilities, water purification and cooling tower water disinfection, where PAA prevents biofilm formation and effectively controls Legionella bacteria.

Peracetic acid also shows potential as a disinfectant for municipal and industrial wastewaters prior to discharge. PAA degrades relatively quickly and does not form toxic disinfection by-products, making it an attractive alternative to chlorine.



Peracetic Acid Chemkey Reagents

SL1000 Portable Parallel Analyzer

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The Hach® SL1000 Portable Parallel Analyzer is a portable automated water analyzer. Colorimetric measurements are conducted simply by inserting the patented Chemkey reagent into the analyzer and dipping into the sample. Micro-doses of analytical reagents are contained inside each Chemkey. Sample is drawn into the Chemkey, mixed and reacted with the reagents, and then measured colorimetrically.

Application: Measuring Peracetic Acid

The Hach PAA Chemkey method follows the N,N-diethyl-p-phenylenediamine (DPD) chemistry which is US EPA accepted for measuring total chlorine in drinking and wastewater. PAA rapidly and quantitatively oxidizes iodide ion (I^-) into triiodide (I_3^-) that reacts with a color indicator (DPD), which turns the solution magenta, Figure 1. The intensity of the magenta color is proportional to the concentration of the PAA.

The SL1000 analyzer contains a colorimeter which has been calibrated to measure the intensity (absorbance) of the magenta color and calculate the result in mg/L of PAA. The calibrated concentration range is 0.04 to 50.0 mg/L PAA. Hydrogen peroxide does not interfere with the PAA analysis due to the quick reaction time.

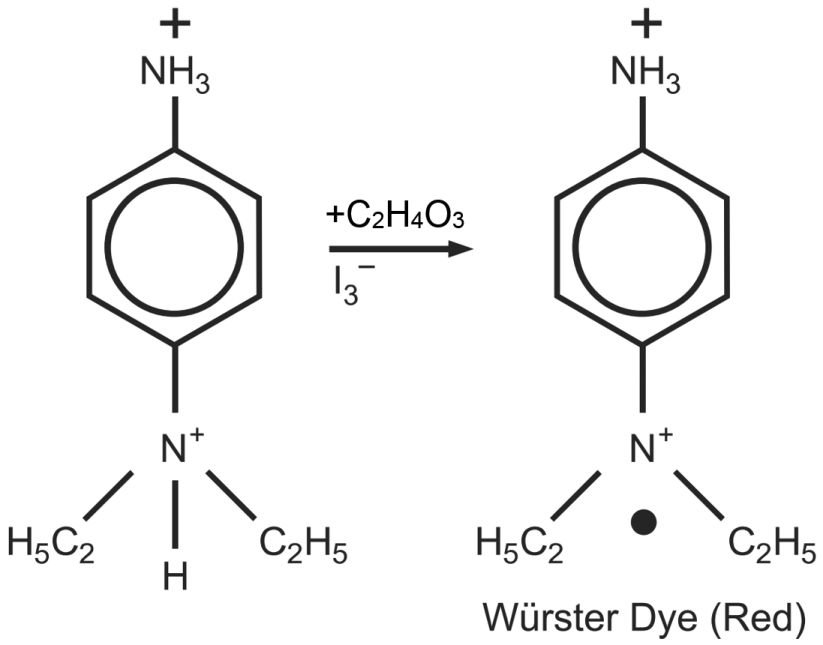

Figure 1 – DPD Color Reaction

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