Nitrogen, Total

For water, wastewater and seawater

Titanium Chloride and Persulfate Digestion Methods

Introduction

Total nitrogen methods measure nitrogen loads on influent streams, at intermediate stages of water treatment for sludge, and on effluent to gauge overall treatment plant efficiency. Assessing nitrogen levels allows process monitoring, adjustment and nitrogen reduction efficiency throughout the treatment.

Titanium chloride reduction method (Total Inorganic Nitrogen)
Titanium (III) ions reduce nitrate and nitrite to ammonia in a basic environment. After centrifugation to remove solids, the ammonia is combined with chlorine to form monochloramine. Monochloramine reacts with salicylate to form 5-aminosalicylate, a green solution, as in the salicylate method in Ammonia Nitrogen (see **Nitrogen, Ammonia**).

Persulfate digestion method (Total Nitrogen)
An alkaline persulfate digestion converts all forms of nitrogen to nitrate. Sodium metabisulfate is added after the digestion to eliminate interferences from halogen oxides. Under strongly acidic conditions, nitrate reacts with chromotropic acid to nitrate the biphenyl rings at several locations, forming several nitrated products (Figure 1). The nitrated products that form are measured at 410 nm.

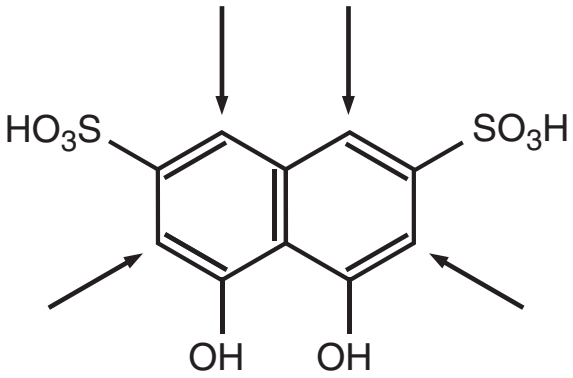

Figure 1 Chromatropic acid structure, including available reaction sites for nitrate