Chloride (Cl⁻) Method

Methods Referenced

- Standard Methods 4500-Cl⁻ E Automated Ferricyanide Method
- EPA Method 325.2 Chloride by Automated Colorimetry AKA Colorimetric, Automated Ferricyanide AAII

Reagent Composition

Final reagent is made from the following sub-solutions:

- 1. Ferric nitrate, Fe(NO₃)₃
- Mercuric thiocyanate, Hg(SCN)₂

Sub-solutions are combined to create the only reagent used for the Cl⁻ method. Final concentrations are as follows:

- 0.6255 g/L Mercury (II) thiocyanate
- 30.3 g/L Iron (III) nitrate nonahydrate
 Or
- 1.974 mmol Hg⁺²
- 3.943 mmol (SCN)⁻
- 75 mmol Fe+3

Chemical Reactions

 $\mathsf{Fe^{+3}} + \mathsf{Hg(SCN)}_2 + \mathsf{Free}\ \mathsf{Cl^-} \to \mathsf{HgCl}_2 + \mathsf{Fe^{+3}} + 2\mathsf{SCN^-} \to \mathsf{HgCl}_2 + \mathsf{Fe(SCN)}_3$

The thiocyanate ion (SCN⁻) is liberated from mercuric thiocyanate through sequestration of mercury by chloride ion to form un-ionized mercuric chloride in the presence of ferric ion, the liberated SCN⁻ forms highly colored ferric thiocyanate in concentration proportional to the original chloride concentration.

ATTENTION: Lire au dos avant ouverture. DETÉNGASE, Lea al dorso anies de obrir, ACHTUNG! Bithe beachten Sie die Rückseife vor dem Öffnen! DA-CL-COLOR COMBINED CHLORIDE COLOR REAGENT: 3.0.3 %W/V: Iron(III) nitrate nonahydrate <0.1% Netron (III) nitrate nonahydrate <1.5% V/V: Wethand <1.5% Nitric acid H2O 125ml Lot: DA-CL-COLOR-1000305052522 DA-CL-COLOR EXPIRES: EXPIRES: TRANSPIRATION CONTROL TECHNOLOGY TECHNOLOGY TECHNOLOGY TECHNOLOGY TECHNOLOGY TECHNOLOGY EXPIRES: EX

Balanced Reaction

12Cl⁻ + 6Hg(SCN)₂ + 4Fe⁺³ → 6HgCl₂ + 4Fe(SCN)₃

Note: Calculations using the limiting factor of Hg^{+2} (by moles) show that this reagent can react with a maximum of ~140 mg/L free chloride.

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