Thermo. Titr. Application Note No. H-017

Title:	**Determination of Bromide and Chloride in Photographic Developer Solutions**

***Scope*:**	Determination of bromide and chloride in photographic developer solutions

***Principle*:**	An aliquot of photographic developer solution is titrated with 0.1M $AgNO_3$. Endpoints are determined using thermometric and potentiometric sensors simultaneously. A combination silver billet/reference electrode was used as the potentiometric sensor

Reagents:	0.1M $AgNO_3$ solution Concentrated HNO_3

Method:

Basic Experimental Parameters:

Data rate (per second)	10
Titrant delivery rate (mL/min.)	1
No. of exothermic endpoints	2
Data smoothing factor (thermo)	55
No. of potentiometric endpoints	2
Data smoothing factor (potentiometric)	110

Procedure: (Fresh Developer or Replenisher). Pipette a 10mL aliquot of undiluted solution into a titration beaker equipped with a spin ring. Add 15 mL deionized water and neutralize with 2mL concentrated nitric acid. Mix, and allow temperature to equilibrate in a room temperature water bath. Titrate to the first endpoint for bromide assay only, or to the second endpoint for combined bromide and chloride determination.

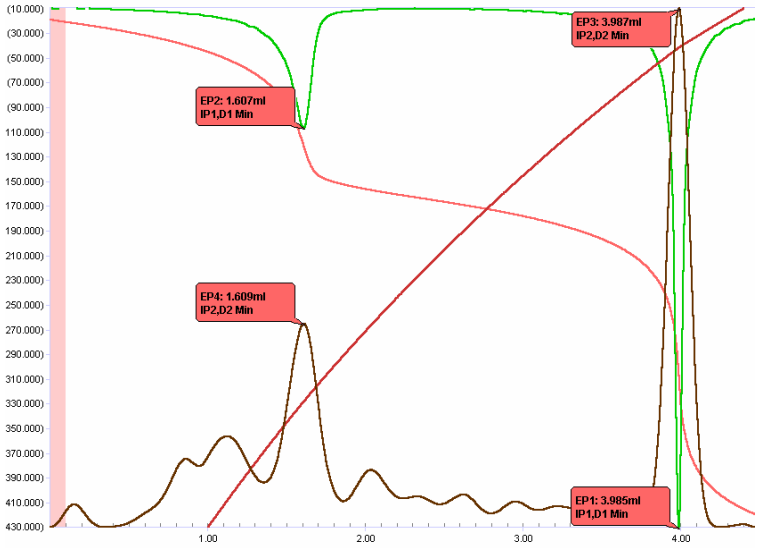
Results:

		Bromide g/L		Chloride g/L	
		Ag billet	Thermo	Ag billet	Thermo
	Mean (n=8)	1.62	1.61	1.39	1.40
	Std. Dev.	0.005	0.007	0.004	0.003

Calculation:

$$halide\ g/L = \frac{((titre - blank) \times M\ AgNO_3 \times FW\ halide\ )}{aliquot, mL}$$

Thermometric/Potentiometric Titration Plot:



Legend:

Potentiometric:

Red = mV curve

Green = first derivative curve

Thermometric:

Plum = solution temperature curve

Brown = second derivative curve