Metrohm

Thermo. Titr. Application Note No. H-104

Title:	**Determination of Free Acid in Hydrometallurgical Leach Liquors**

***Scope*:**	Determination of the „free acid“ content of hydrometallurgical leach liquors

***Principle*:**	A measured amount of acidic hydrometallurgical leach liquor is treated with potassium oxalate solution to mask potential interference from Fe(III) and other metal ions, and then titrated with standard 1 mol/L NaOH solution

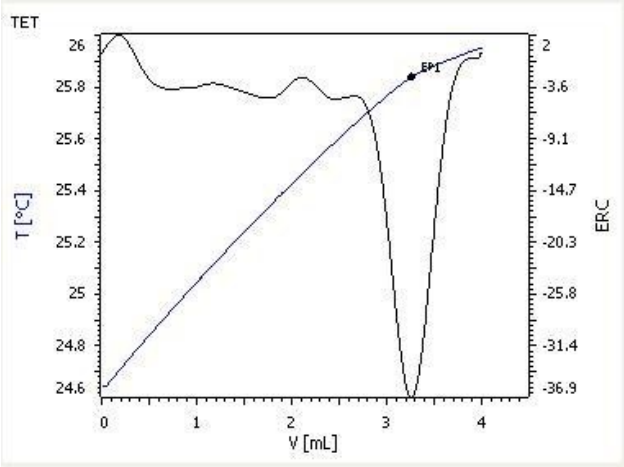
Reagents:	Titrant: standard sodium hydroxide solution, c(NaOH) =1mol/L. Prepare from A.R. NaOH and standardize against A.R. potassium hydrogen phthalate, freshly dried at 110ºC for 2 hours. Masking solution: 30% w/v potassium oxalate solution

Method:	Basic Experimental Parameters:	
	Titrant delivery rate (mL/min.)	4
	No. of exothermic endpoints	1
	Data smoothing factor (DSF)	50
	Stirring speed (802 stirrer)	8
	Delay before start of titration (secs.)	10
	A 10mL aliquot of acidic process liquor is pipetted by volumetric glass pipette into a PP titration tube, and 10mL 30% w/w $K_2C_2O_4$ solution plus 10mL DI water added. The sample solution is swirled to mix prior to being placed in the sample rack.	

Example:	*Acidic hydrometallurgical leach liquor, containing Fe(II), Fe(III)), Mg, Al, Mn, Cr, Cu, Co and Ca.*
	15.7±0.06g/L (n=5), expressed as H_2SO_4 equivalent

Calculations:	
Free acid, g/L =	$\frac{((\text{EP vol., mL- Blank, mL}) \times \text{c(NaOH) mol/L} \times \text{FW } H_2SO_4)}{(\text{Sample vol., mL} \times 2)}$

Titration Plot:



Legend:
Blue curve = solution temperature
Black curve = second derivative (ERC)