

Application Memo

Nitric Acid and HF in Pickling Solution

Industry	Inorganic chemical industry
Instrument	Automatic potentiometric titrator
Measurement method	Acid-base titration
Standards	

1. Overview

A mixture of nitric acid and hydrofluoric acid (HF) is used as pickling for surface cleaning of stainless steel. The dissociation constants of nitric acid and HF in aqueous solution are so high that it is difficult to find both endpoints in normal titration. But acetone is added during acid-base titration, different dissociation constants of H⁺ ion between nitric acid and HF appear. Then, each endpoint can be defined, and the concentration of each chemical is determined by each titration volume.

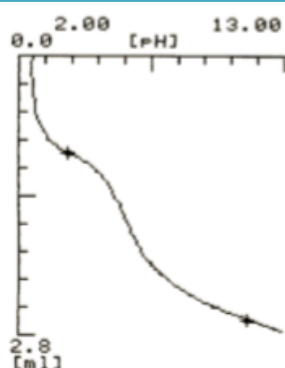
2. Apparatus

Main unit	Automatic potentiometric titrator (preamplifier STD)
Electrode	pH glass electrode Ceramic reference electrode (Internal solution: 3.33M potassium chloride) Temperature compensation electrode

3. Reagents

Titrant	0.1mol/L potassium hydroxide 2-propanol
Solvent	Acetone

4. Example



—Titration curve—

	Nitric acid (%)	HF (%)
1	6.156	3.347
2	6.174	3.378
3	6.195	3.211
Average	6.175	3.312
SD	0.019	0.089
RSD(%)	0.31	2.7

Please feel free to contact us for any further information.
<Contact> Kyoto Electronics Manufacturing Co., Ltd.
Overseas Sales & Marketing Sect.
<http://www.kyoto-kem.com/en/contact/form.php>