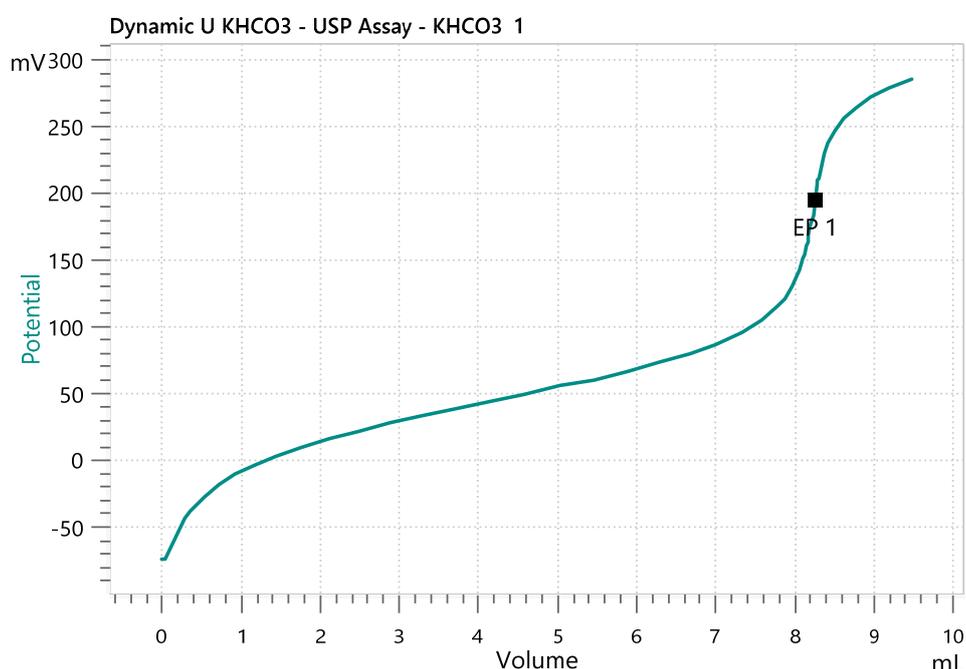


Titration Application Note T-210

Assay of potassium carbonate and potassium bicarbonate

Reliable, and selective determination of both species



Potassium carbonate and potassium bicarbonate are important raw materials in the pharmaceutical industry. As APIs, both can be used in effervescent tablets and powders as supplements to help patients with low potassium levels in their blood.

For both species, the other species is the most important contamination. For the assay, a selective method is thus required. Separation of both species by ion chromatography is not possible as the eluent changes the ratio of carbonate and bicarbonate falsifying the result. Due to their different pKa values, carbonate and hydrogen carbonate can be selectively determined by titration, which is therefore the method of choice for pharmacopeias, such as the USP and Ph.Eur.

Using potentiometric autotitration instead of manual titration increases the accuracy and reliability of results. Furthermore, the use of an autotitrator ensures that crucial requirements of regulatory compliance guidelines such as data integrity are met.

Method description

Sample

Potassium carbonate (99.5 – 101.5%)

Potassium bicarbonate (99.5 – 101.5%)

Sample preparation

No sample preparation is required

Configuration

OMNIS Advanced Titrator with magnetic stirrer	2.1001.0220
OMNIS Dosing module	2.1003.0010
OMNIS Cylinder unit 50 mL	6.03001.250
OMNIS Cylinder unit 20 mL	6.03001.220
Digital measuring module	6.02100.010
OMNIS Stand-alone license	6.06003.010
dEcotrode plus	6.00201.300

Solutions

Titrant	c(HCl) = 1 mol/L This solution should be bought from a supplier.
---------	---

Analysis

0.7 g potassium carbonate or 0.8 g potassium bicarbonate is weighed into a titration beaker. 100 mL carbon dioxide-free water is added and the sample is then titrated with c(HCl) = 1 mol/L until after the second equivalence point.

If the potassium bicarbonate does not contain any carbonate, only one equivalence point will be found.

Parameters

Mode	DET U
Pause	0 s
Signal drift	30.0 mV/min
Min. waiting time	0 s
Max. waiting time	32 s
Min. Volume increment	10 µL
Meas. point distance	2
Stirring rate	10
Stop volume	20 mL
EP criterion	10
EP recognition	all

Results

Mean result for both assays (n = 9)

	Potassium carbonate	Potassium bicarbonate
Mean	100.40%	99.58%
s(rel)	0.43%	0.15%