



C1.7.2 ACID STRENGTHS AND pH VALUES

C1.7.2.2
Analysis of triprotic phosphoric
acid by titration

Analysis of triprotic phosphoric acid by titration (C1.7.2.2)

Cat. No.	Description	C1.7.2.2
524 013	Sensor-CASSY 2	1
524 220	CASSY Lab 2	1
524 0672	pH adapter S	1
667 4172	pH sensor with plastic shaft, BNC	1
524 074	Timer S	1
337 4681	Drop counter	1
607 105	Magnetic stirrer mini	1
664 103	Beaker, DURAN, 250 ml, squat	2
665 997	Graduated pipette 10 ml	1
666 003	Pipetting ball (Peleus ball)	1
665 847	Burette, clear glass, 50 ml	1
665 816	Burette filling funnel plastic, 35 mm Ø	1
666 559	Burette clamp for 1 burette, roller clamp	1
300 02	Stand base, V-shaped, small	1
300 43	Stand rod, 75 cm, 12 mm diam.	1
300 11	Saddle base	1
301 26	Stand rod 25 cm, 10 mm Ø	1
301 09	Bosshhead S	2
666 555	Universal clamp 0...80 mm	2
661 082	Stopcock grease, 60 g	1
674 3440	Phosphoric acid, 10 %, 100 ml	1
673 8421	Sodium hydroxide solution, 1 mol/l, 1 l	1
674 4640	Buffer solution pH 4.00, 250 ml	1
674 4670	Buffer solution pH 7.00, 250 ml	1
675 1600	Thymolphthalein solution, 0.1 %, 50 ml	1*

Cat. No.	Description	C1.7.2.2
	additionally required: PC with Windows XP/Vista/7/8/10 (x86 or x64)	1

* additionally recommended

Phosphoric acid is a triprotic acid. When dissolved in water, it first gives up one proton and dissociates to dihydrogen phosphate, i.e. it reacts like a monoprotic acid (see formula 1). The addition of sodium hydroxide, e.g. during titration, first leads to complete dissociation of the phosphoric acid into dihydrogen phosphate.

The second protolysis, i.e. the reaction to hydrogen phosphate (see formula 2), occurs only after a high pH value has been reached, approx. pH 9. The third protolysis requires a considerably higher pH value (see formula 3). In experiment C1.7.2.2, the first two protolysis steps of phosphoric acid are determined in an automatic titration.

