









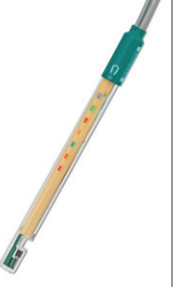


Electrodes for USP monographs

Which electrode for which indication?

Titrant	Specifics	Electrode	Order no.	Titrant	Specifics	Electrode	Order no.
Acetic acid	All indicators	dEcotrode plus	6.00201.300	Potassium dichromate	All indicators	dPt Titrode	6.00401.300
Ammonium thiocyanate	Ferric ammonium sulfate, sample contains silver or silver nitrate VS is added in excess	dAg Titrode	6.00404.300S	Potassium ferricyanide	All indicators	dPt Titrode	6.00401.300
	Ferric ammonium sulfate, sample contains mercury	Comb. Au ring electrode	6.0452.100	Potassium hydroxide	Aqueous titrant, all indicators, solvent is water	dEcotrode plus	6.00201.300
	Silver electrode and double-junction reference electrode	Sep. Ag ring electrode	6.00350.100S		Non-aqueous titrant, all indicators, non-aqueous solvent	dSolvoltrode	6.00203.300
	Other electrodes	dAg Titrode	6.00404.300S	Potassium iodate	All indicators	dPt Titrode	6.00401.300
Barium perchlorate	All indicators	Cu ²⁺ ISE	6.0502.140	Potassium permanganate	All indicators	dPt Titrode	6.00401.300
Benzethonium chloride	Methylene blue	Surfactrode Resistant	6.0507.130	Potassium thiocyanate	All indicators	dAg Titrode	6.00404.300S
Bismuth nitrate	All indicators	Cu ²⁺ ISE	6.0502.140		Silver electrode and double-junction reference electrode	Sep. Ag ring electrode	6.00350.100S
Bromine	All indicators	dPt Titrode	6.00401.300	Silver nitrate	Potassium chromate is used as indicator	dAg ring electrode	6.00402.300S
Ceric ammonium nitrate, ceric ammonium sulfate, ceric sulfate	All color indicators, combined platinum electrode, potentiometric indication	dPt Titrode	6.00401.300		All other color indicators, potentiometric indication with all electrodes, except listed below	dAg Titrode	6.00404.300S
	Electrodes with silver-silver chloride or calomel reference system	dPt-ring-electrode	6.00403.300		Electrodes with silver-silver chloride or calomel reference system	dAg ring electrode	6.00402.300S
Cupric nitrate	All indicators	Cu ²⁺ ISE	6.0502.140		Silver-ion selective electrode	Ag ⁺ /S ²⁻ ISE	6.0502.180
Dichlorophenol-Indophenol	All indicators	Double Pt sheet electrode	6.0309.100	Silver electrode and double-junction reference electrode	Sep. Ag ring electrode	6.00350.100S	
		or Double Au ring electrode	6.00353.100	Sodium arsenite	All indicators	dPt Titrode	6.00401.300
Edetate disodium (EDTA)	Hydroxy naphthol blue, calconcarboxylic acid tritrate, or calcium ion-selective electrode	dCa ²⁺ ISE	6.00502.300		Aqueous titrant, all indicators, solvent is water	dEcotrode plus	6.00201.300
	Other potentiometric indication	Cu ²⁺ ISE	6.0502.140	Sodium hydroxide	Non-aqueous titrant, all indicators, non-aqueous solvent	dSolvoltrode	6.00203.300
	Other color indicators	Optrode	6.1115.000	Sodium methoxide	All indicators	dSolvoltrode	6.00203.300
Ferric and ferrous ammonium sulfate	All indicators	dPt Titrode	6.00401.300	Sodium nitrite	Starch, platinum-calomel electrodes	dPt ring electrode	6.00403.300
Hydrochloric acid	Aqueous titrant, all indicators, solvent is water	dEcotrode plus	6.00201.300		Platinum-platinum electrodes	Double Pt sheet electrode	6.0309.100
	Non-aqueous titrant, all indicators, non-aqueous solvent	dSolvoltrode	6.00203.300	Sodium tetraphenylboron	Bromophenol blue solution (1 in 2000)	NIO surfactant electrode	6.0507.010
Iodine	All indicators	dPt Titrode	6.00401.300		Combined potassium ion selective electrode	K ⁺ ISE	6.0510.110
Lead nitrate and lead perchlorate	All indicators	Pb ²⁺ ISE	6.0502.170	Sodium thiosulfate	All color indicators and electrodes except with calomel reference system	dPt Titrode	6.00401.300
Lithium methoxide	All indicators	dSolvoltrode	6.00203.300		Electrodes with calomel reference electrode	dPt ring electrode	6.00403.300
Magnesium chloride	Eriochrome black-T-sodium chloride	Optrode	6.1115.000	Sulfuric acid	Aqueous titrant, all indicators, solvent is water	dEcotrode plus	6.00201.300
	Copper ion-selective electrode	Cu ²⁺ ISE	6.0502.140			Non-aqueous titrant, all indicators, non-aqueous solvent	dSolvoltrode
Mercuric nitrate	All indicators	Comb. Au ring electrode	6.0452.100	Tetrabutylammonium hydroxide	All indicators	dSolvoltrode	6.00203.300
Oxalic acid	All indicators	dPt Titrode	6.00401.300	Tetramethylammonium bromide	All indicators	dAg Titrode	6.00404.300S
	All color indicators, all electrodes except below	dSolvoltrode	6.00203.300	Tetramethylammonium chloride	All indicators	dAg Titrode	6.00404.300S
Perchloric acid	Electrodes with lithium chloride or lithium perchlorate in glacial acetic acid as electrolyte	Special double junction Solvoltrode		Titanium trichloride	All indicators	dPt Titrode	6.00401.300
				Zinc sulfate	All color indicators	Optrode	6.1115.000
Potassium arsenite	All indicators	dPt Titrode	6.00401.300			Copper ion-selective electrode	Cu ²⁺ ISE
Potassium bromate	All indicators	dPt Titrode	6.00401.300				
Potassium bromide - potassium bromate	All indicators	Double Pt-wire electrode for coulometry	6.0341.100				

Practical tips, care and maintenance of electrodes for titration

Ecotrode Plus	Solvotrode	Ag/Pt Titrode	Combined Ag/Pt/Au ring electrodes	Cu ISE	Polarizable Pt/Au electrodes	Pb ISE, Ag/S ISE	Ca ISE	Surfactrodes	Surfactant electrodes	Optrode
<p>Fixed ground-joint diaphragm</p> <ul style="list-style-type: none"> • Insensitive to contamination • Attractive price/performance ratio <p>Ordering Info: 6.0262.100¹⁾ dEcotrode Plus: 6.00201.300²⁾</p>	<p>Flexible-sleeve diaphragm for easy cleaning</p> <ul style="list-style-type: none"> • For titration in nonaqueous matrices • Rapid response in organic solvents • Electrically shielded <p>Ordering Info: 6.0229.010 (1 m fixed cable) 6.0229.020 (2 m fixed cable) dSolvotrode: 6.00203.300²⁾</p>	<p>Maintenance-free pH glass reference system</p> <ul style="list-style-type: none"> • Also available as micro-electrodes with 6.4 mm diameter <p>Ordering Info: Ag: 6.00430.100¹⁾ Pt: 6.0431.100¹⁾ dAg: 6.00404.300²⁾ dPt: 6.00401.300²⁾</p>	<p>Fixed ground-joint or ceramic pin diaphragm</p> <ul style="list-style-type: none"> • For precipitation or redox titrations with change of pH value <p>Ordering Info: Ag: 6.00450.100¹⁾ Pt: 6.0451.100¹⁾ Au: 6.0452.100¹⁾ dAg: 6.00402.300²⁾ dPt: 6.00401.300²⁾</p>	<p>Crystal membrane ion-selective electrode</p> <ul style="list-style-type: none"> • For complexometric titrations with EDTA • Suitable for small sample volumes <p>Ordering Info: 6.0502.140¹⁾</p>	<p>Polarizable metal electrodes</p> <ul style="list-style-type: none"> • For redox titrations with Ipol mode (e.g., vitamin C titration) <p>Ordering Info: Pt-sheet: 6.0309.100¹⁾ Pt-wire: 6.0341.100¹⁾ Au: 6.00353.100¹⁾</p>	<p>Crystal membrane ion-selective electrode</p> <ul style="list-style-type: none"> • For precipitation titrations with lead nitrate, lead perchlorate or silver nitrate, respectively • Suitable for small sample volumes <p>Ordering Info: Pb: 6.0502.170¹⁾ Ag/S: 6.0502.180¹⁾</p>	<p>Combined polymer membrane ion-selective electrode</p> <ul style="list-style-type: none"> • For complexometric titrations of calcium with EDTA • No additional reference electrode required • Suitable for small sample volumes <p>Ordering Info: 6.0510.100¹⁾ dCa ISE: 6.00502.300²⁾</p>	<p>For surfactant titrations in nonaqueous media</p> <p>Surfactrode Resistant (6.0507.130)¹⁾ Resistant to chloroform and many other solvents.</p> <p>Surfactrode Refill (6.0507.140)¹⁾ Refillable surfactant electrode, thus practically unlimited working life. Not resistant to chloroform.</p> <p>Surfactrode refill paste: 6.2319.000</p>	<p>For surfactant titrations in aqueous media</p> <p>NIO electrode (6.0507.010)¹⁾ For titration of non-ionic surfactants</p> <p>Ionic Surfactant (6.0507.120)¹⁾ Optimized for anionic surfactants</p> <p>Cationic Surfactant (6.0507.150)¹⁾ Optimized for cationic surfactants</p>	<p>Power supplied by titrator via USB, no separate power adapter needed</p> <p>Ordering Info: 6.1115.000 Optional: 6.2166.000 USB power supply unit for titrators without USB connector.</p>
										
<p>Store in 6.2323.000 storage solution only.</p> <p>Do not wipe electrode.</p> <p>For cleaning/care 6.2325.000 pHit kit is recommended.</p>	<p>Store in reference electrolyte.</p> <p>Do not wipe electrode.</p> <p>In case of contamination with organic residues, immerse sensor in an appropriate solvent (for 30 min).</p> <p>Condition glass membrane in dist. water before next titration.</p> <p>Alternative electrolyte: c(TEABr) = 0.4 mol/L in ethylene glycol (6.2320.000).</p>	<p>Store in distilled water only.</p> <p>Testing of the electrodes according to AB-048.</p> <p>Ag Titrodes also available with Ag₂S or Ag-halide coating.</p>	<p>Store in reference electrolyte.</p> <p>Testing of the electrodes according to AB-048.</p> <p>Ag ring electrodes also available with Ag₂S or Ag-halide coating.</p>	<p>Store dry and protected from light.</p> <p>Polish with polishing set (6.2802.000) from time to time.</p>	<p>Store dry.</p> <p>Polish with polishing set (6.2802.000) from time to time.</p>	<p>Store dry.</p> <p>Polish with polishing set (6.2802.000) from time to time.</p>	<p>Store dry with some drops of distilled water in the storage vessel.</p> <p>Do not use organic solvents for rinsing.</p>	<p>Store dry.</p> <p>Allow a few titrations for conditioning of the Surfactrodes.</p> <p>Reactivate Surfactrode Resistant with fine-grained sandpaper if response is poor.</p> <p>Testing of the electrodes according to AB-305.</p>	<p>Store dry.</p> <p>Rinse with dist. water or 20% methanol in water.</p> <p>Wipe carefully with a methanol-soaked tissue to remove any adhering contamination.</p> <p>Do not use in organic matrices or at temperatures >40 °C.</p> <p>Testing of the electrodes according to AB-305.</p>	<p>Allow 5 minutes for warming up the LED.</p>

¹⁾ Electrodes with no cable and no temperature probe have plug-in head G

²⁾ dTrodes can only be used with a digital measuring module at an OMNIS Titrator / Titration Module.