



# Indicators versus Electrodes

<b>Titrant</b>	<b>Indicator for visual endpoint</b>	<b>Sample information</b>	<b>Electrode</b>
Acetic acid	All indicators	-	Combined pH electrode for aqueous solution
Ammonium thiocyanate	Ferric ammonium sulfate TS	Sample contains silver salt or silver nitrate VS is added in excess for residual titration	Combined silver electrode
	Ferric ammonium sulfate TS	Sample contains mercury	Combined gold electrode
	Other indicators		Combined silver electrode
Barium Perchlorate	All indicators		Copper ion-selective electrode and Ag/AgCl reference electrode
Benzethonium Chloride	Methylene blue	Chlorinated solvents are used	Surfactant electrode resistant to chlorinated solvents and Ag/AgCl reference electrode
	Other indicators		Surfactant electrode suitable for non-ionic surfactants and Ag/AgCl reference electrode
Bismuth Nitrate	All indicators		Copper ion-selective electrode and Ag/AgCl reference electrode
Bromine	All indicators		Combined platinum electrode
Ceric Ammonium Nitrate	All indicators		Combined platinum electrode
Ceric Ammonium Sulfate	All indicators		Combined platinum electrode
Ceric Sulfate	All indicators		Combined platinum electrode
Cupric Nitrate	All indicators		Copper ion-selective electrode and Ag/AgCl reference electrode
Dichlorophenol-Indophenol	All indicators		Polarizable gold or platinum electrode
Edetate Disodium	Hydroxy naphthol blue, calconcarboxylic acid triturate, or combined calcium ion-selective electrode		Combined calcium ion-selective electrode
	Other potentiometric indication		Copper ion-selective electrode and Ag/AgCl reference electrode
	Other indicators		Photometric sensor
Ferric Ammonium Sulfate	All indicators		Combined platinum electrode
Ferrous Ammonium Sulfate	All indicators		Combined platinum electrode
Hydrochloric Acid	All indicators	Solvent is water	Combined pH electrode for aqueous solution
	All indicators	Non-aqueous solvent	Combined pH electrode for non-aqueous solution
Alcoholic Hydrochloric Acid	All indicators		Combined pH electrode for non-aqueous solution
Hydrochloric Acid in Methanol	All indicators		Combined pH electrode for non-aqueous solution
Iodine	All indicators		Combined platinum electrode
Lead Nitrate	All indicators		Lead ion-selective electrode and Ag/AgCl reference electrode



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Lead Perchlorate	All indicators		Lead ion-selective electrode and Ag/AgCl reference electrode
Lithium Methoxide in Chlorobenzene	All indicators		Combined pH electrode for non-aqueous solution
Lithium Methoxide in Methanol	All indicators		Combined pH electrode for non-aqueous solution
Lithium Methoxide in Toluene	All indicators		Combined pH electrode for non-aqueous solution
Magnesium Chloride	Eriochrome black-T-sodium chloride		Photometric sensor
	Copper ion-selective electrode		Copper ion-selective electrode and Ag/AgCl reference electrode
Mercuric Nitrate	All indicators		Combined gold electrode
Oxalic Acid	All indicators		Combined platinum electrode
Perchloric Acid in Dioxane	All indicators		Combined pH electrode for non-aqueous solution
Perchloric Acid (in Glacial Acetic Acid)	All indicators		Combined pH electrode for non-aqueous solution
Potassium Arsenite	All indicators		Combined platinum electrode
Potassium Bromate	All indicators		Combined platinum electrode
Potassium Bromide–Bromate	All indicators		Polarizable platinum wire electrode
Potassium Dichromate	All indicators		Combined platinum electrode
Potassium Ferricyanide	All indicators		Combined platinum electrode
Alcoholic Potassium Hydroxide	All indicators		Combined pH electrode for non-aqueous solution
Methanolic Potassium Hydroxide	All indicators		Combined pH electrode for non-aqueous solution
Potassium Hydroxide	All indicators	Solvent is water	Combined pH electrode for aqueous solution
	All indicators	Non-aqueous solvent	Combined pH electrode for non-aqueous solution
Potassium Iodate	All indicators		Combined platinum electrode
Potassium Permanganate	All indicators		Combined platinum electrode
Potassium Thiocyanate	All indicators		Combined silver electrode
	silver-based indicator electrode and a double-junction reference electrode		Separate silver electrode and double-junction reference electrode
Silver Nitrate	All indicators		Combined silver electrode
	Silver-ion selective electrode or silver-sulfide specific ion-selective electrode		Silver-sulfide specific ion-selective electrode and Ag/AgCl reference electrode
	Silver-silver chloride double junction reference electrode and a silver billet electrode		Separate silver electrode and double-junction reference electrode
	All other potentiometric indication		Combined silver electrode
Silver Nitrate in (Isopropyl) Alcohol	Potentiometric indication		Combined silver electrode
	Silver billet indicator electrode and a silver–silver chloride double-junction reference electrode containing a potassium nitrate salt bridge		Separate silver electrode and double-junction reference electrode



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Sodium Arsenite	All indicators		Combined platinum electrode
	All indicators and potentiometric indication	Solvent is water	Combined pH electrode for aqueous solution
Sodium hydroxide	All indicators and potentiometric indication	Non-aqueous solvent	Combined pH electrode for non-aqueous solution
	Glass-calomel or a silver-silver chloride electrode system with potassium nitrate filling solution		Combined pH electrode with double-junction reference system
Alcoholic Sodium Hydroxide	All indicators		Combined pH electrode for non-aqueous solution
Sodium Methoxide in Methanol	All indicators		Combined pH electrode for non-aqueous solution
Sodium Methoxide in Toluene	All indicators		Combined pH electrode for non-aqueous solution
	All indicators, platinum-calomel electrodes, or combined platinum electrode		Combined platinum electrode
Sodium Nitrite	Platinum-platinum electrodes		Polarizable platinum electrode
	bromophenol blue solution (1 in 2000)		Surfactant electrode suitable for non-ionic surfactants and Ag/AgCl reference electrode
Sodium Tetraphenylboron	combined potassium ion selective electrode		Combined potassium ion-selective electrode
Sodium Thiosulfate	All indicators		Combined platinum electrode
	All indicators and potentiometric indication	Solvent is water	Combined pH electrode for aqueous solution
Sulfuric Acid	All indicators and potentiometric indication	Non-aqueous solvent	Combined pH electrode for non-aqueous solution
	All indicators	Dilution with water	Combined pH electrode for aqueous solution
Sulfuric Acid in Alcohol	All indicators	Non-aqueous solvent	Combined pH electrode for non-aqueous solution
Tetrabutylammonium Hydroxide	All indicators		Combined pH electrode for non-aqueous solution
Tetrabutylammonium Hydroxide in Methanol/Isopropyl Alcohol	All indicators		Combined pH electrode for non-aqueous solution
Tetramethylammonium Bromide	All indicators		Combined silver electrode
Tetramethylammonium Chloride	All indicators		Combined silver electrode
Titanium Trichloride	All indicators		Combined platinum electrode
	All indicators		Photometric sensor
Zinc Sulfate	copper ion-selective electrode		Copper ion-selective electrode and Ag/AgCl reference electrode