

5.3 ISE general application guide

Ion Selective Electrode Applications	Concentration Range	Temperature/ pH Range	Interferences
Ammonia (NH₃) High purity power station water, fish tanks, sea water, waste water, plating baths, air/stack gases, and biological samples Type: gas sensing	(0.01 to 17,000 ppm) 5 x 10 ⁻⁶ to 1.0 M	0 to 50°C / above 11	Volatile amines
Ammonium (NH₄⁺) Boiler feed water, natural water and fertilizers Type: polymer membrane, epoxy combination	(0.01 to 18,000 ppm) 5 x 10 ⁻⁶ to 1.0 M	0 to 50°C / 4 to 10	K ⁺
Bromide (Br⁻) Water, wine, plant tissue, and clinical analysis Type: solid state, epoxy combination	(0.4 to 79,000 ppm) 5 x 10 ⁻⁶ to 1.0 M	0 to 80°C / 2 to 14	S ⁻² , I ⁻ , CN ⁻ , high Cl ⁻ and NH ₃ levels
Cadmium (Cd⁺²) Plating baths Type: solid state, epoxy combination	(0.01 to 11,200 ppm) 1 x 10 ⁻⁷ to 0.1 M	0 to 80°C / 2 to 12	Ag ⁺ , Hg ⁺² , Cu ⁺² , high Pb ⁺² and Fe ⁺² levels
Calcium (Ca⁺²) Water softening systems, boiler feed water, drinking/mineral water, clinical analysis, and food applications Type: polymer membrane, glass combination	(0.2 to 40,000 ppm) 5 x 10 ⁻⁶ to 1.0 M	0 to 50°C / 3 to 10	Pb ⁺² , Hg ⁺² , Cu ⁺² , Ni ⁺² , Fe ⁺² , Mg ⁺² , Zn ⁺² , Ba ⁺² , K ⁺² , K ⁺ , Na ⁺
Carbon Dioxide (CO₂), Carbonate (CO₃⁻²) Soft drinks/carbonated beverages, wine, beer, fermentation processes, bacterial cultures Type: gas sensing	(4.4 to 440 ppm) 1 x 10 ⁻⁴ to 1 x 10 ⁻² M	0 to 50°C / 4.8 to 5.2	Volatile weak acids
Chloride (Cl⁻) River/tap water, plant tissue, soils, boiler feed water, clinical analysis, sweat, urine, cement, plating baths, and food samples Type: solid state, epoxy combination	(1.8 to 35,500 ppm) 5 x 10 ⁻⁵ to 1.0 M	0 to 80°C / 2 to 12	S ⁻² , I ⁻ , CN ⁻ , Br ⁻ , OH ⁻ , NH ₃ , S ₂ O ₃ ⁻² ,
Copper (Cu⁺²) Plating baths and water Type: solid state, epoxy combination	(0.0006 to 6350 ppm) 1 x 10 ⁻⁸ to 0.1 M	0 to 80°C / 2 to 12	Ag ⁺ , Hg ⁺² , high Cl ⁻ , Br ⁻ , Fe ⁺² and Cd ⁺² levels
Cyanide (CN⁻) Plating baths, waste water and plant tissue Type: solid state, epoxy combination	(0.13 to 260 ppm) 5 x 10 ⁻⁶ to 0.01 M	0 to 80°C / 11 to 13	S ⁻² , I ⁻ , Br ⁻ , Cl ⁻
Fluoride (F⁻) Drinking/natural water, waste water, air/stack gases, acids, sea water minerals, soils, food, biological fluids, toothpaste/mouth wash, coal, carbonated beverages, and bone Type: solid state, epoxy combination	0.02 ppm to saturated (1 x 10 ⁻⁶ M to saturated)	0 to 80°C / 5 to 8	OH ⁻
Iodide (I⁻) Milk, feeds, plants and pharmaceuticals Type: solid state, epoxy combination	(0.006 to 127,000 ppm) 5 x 10 ⁻⁸ to 1.0 M	0 to 80°C / 0 to 14	S ⁻² , CN ⁻ , Br ⁻ , Cl ⁻ , NH ₃ , S ₂ O ₃ ⁻²
Lead (Pb⁺²) Plating baths and organic compounds Type: solid state, epoxy combination	(0.2 to 20,7000 ppm) 1 x 10 ⁻⁶ to 0.1 M	0 to 80°C / 3 to 8	Ag ⁺² , Hg ⁺² , Cu ⁺² , high Cd ⁺² and Fe ⁺² levels
Nitrate (NO₃⁻) Surface/drinking water, sewage effluent, soil extracts, fertilizers, plant tissue, meat, potatoes, spinach, beets, baby food Type: polymer membrane, epoxy combination	(0.5 to 62,000 ppm) 7 x 10 ⁻⁶ to 1.0 M	0 to 50°C / 2.5 to 11	ClO ₄ ⁻ , I ⁻ , CN ⁻ , BF ₄ ⁻
Potassium (K⁺) Waste water, river/tap water, clinical analysis, saliva, serum, fertilizers, soils, and wines Type: polymer membrane, epoxy combination	(0.04 to 39,000 ppm) 1 x 10 ⁻⁶ to 1.0 M	0 to 50°C / 2 to 12	Cs ⁺ , NH ₄ ⁺ , Tl ⁺ , H ⁺ , Ag ⁺ , Li ⁺ , Na ⁺ , Tris1 ⁺
Silver/Sulfide (Ag⁺/S⁻²) Sewage effluent, soils, sediments, plating baths and photographic fixing solution Type: solid state, epoxy combination	(0.01 to 107,900 ppm Ag ⁺) (0.003 to 32,100 ppm S ⁻²) 1 x 10 ⁻⁷ to 1.0 M (Ag ⁺ , S ⁻²)	0 to 80°C / 2 to 12	Hg ⁺²
Sodium (Na⁺) Steam condensates in power plants, clinical analysis, serum, foods, wine, glass, sea water, swimming pools, fish farms and aquariums Type: glass membrane, glass combination	(0.02 ppm to saturated) 1 x 10 ⁻⁶ M to saturated	0 to 80°C / 5 to 12	H ⁺ , K ⁺ , Li ⁺ , Ag ⁺ , NH ₄ ⁺ , Rb ⁺ , Cs ⁺ , Tl ⁺



Electrode	Standard 0.1 M Solution	Standard 100 ppm Solution	Standard 1000 ppm Solution	Ion Strength Adjuster (ISA)
EC-NH301-01B	EC-SCS-AA1-BT	EC-SCS-AA2-BT	EC-SCS-AA3-BT	EC-ISA-AA1-BT
EC-NH403-01B	EC-SCS-AM1-BT	EC-SCS-AM2-BT	EC-SCS-AM3-BT	EC-ISA-AM1-BT
EC-BRO03-01B	EC-SCS-BR1-BT	EC-SCS-BR2-BT	—	EC-ISA-BR1-BT
EC-CD03-01B	EC-SCS-CD1-BT	EC-SCS-CD2-BT	—	EC-ISA-CD1-BT
EC-CAL02-01B	EC-SCS-CA1-BT	EC-SCS-CA2-BT	EC-SCS-CA3-BT	EC-ISA-CA1-BT
EC-CO201-01B	EC-SCS-CO1-BT	EC-SCS-CO2-BT	EC-SCS-CO3-BT	EC-ISA-CO1-BT
EC-CLO03-01B	EC-SCS-CL1-BT	EC-SCS-CL2-BT	EC-SCS-CL3-BT	EC-ISA-CL1-BT
EC-CU03-01B	EC-SCS-CU1-BT	EC-SCS-CU2-BT	—	EC-ISA-CU1-BT
EC-CN03-01B	—	—	—	—
EC-FO03-01B	EC-SCS-FL1-BT	EC-SCS-FL2-BT	EC-SCS-FL3-BT	EC-ISA-FL1-BT
EC-IO03-01B	EC-SCS-IO1-BT	EC-SCS-IO2-BT	—	EC-ISA-IO1-BT
EC-PB03-01B	EC-SCS-PB1-BT	EC-SCS-PB2-BT	—	EC-ISA-PB1-BT
EC-NO303-01B	EC-SCS-NT1-BT	EC-SCS-NT2-BT	EC-SCS-NT3-BT	EC-ISA-NT1-BT
EC-K03-01B	EC-SCS-KO1-BT	EC-SCS-KO2-BT	—	EC-ISA-KO1-BT
EC-AGS03-01B	EC-SCS-SS1-BT	EC-SCS-SS2-BT	—	EC-ISA-SS1-BT
EC-NA02-01B	EC-SCS-LNA1-BT	EC-SCS-LNA2-BT	EC-SCS-LNA3-BT	EC-ISA-LNA1-BT

