

Reference Electrode Selection Guide

Model	Junction Type	Refillable	Typical Impedance / K Ω	Application
Ag/AgCl Electrodes				
EChem-Ref-R	Single junction, porous ceramic frit	Y	1.0	Research
IJ-14	Double junction, sleeve junction	Y	10	Field use, suitable for contaminated and colloidal samples.
GBDJ-AgAgCl	Double junction, porous ceramic frit	Y	1.0	Contaminated samples
Additional Secondary Junction				
EChem-ASJ	Single junction, porous ceramic frit	Y	0.5	Additional junction, suitable for Echem-Ref-R and Echem-Ref-R-SR
Calomel Electrode				
Cal-Ref-01-K	Single junction, porous ceramic frit	Y	0.7	Suitable for samples exposed to light
Ag/Ag⁺ Electrode				
EChem-Ref-R-SR	Single junction, porous ceramic frit	Y	5-10	Organic solvents, can be used in conjunction with Echem-ASJ
Ag/Ag₂SO₄ Electrode				
GBDJ-AgAgSu	Single junction, porous ceramic frit	Y	5-10	Chloride free samples. Avoid contaminating sample with chloride ions
Ag/Ag₂O Electrode				
PBDJ-AgAg2O	Single junction, porous ceramic frit	Y	5-10	Extreme alkaline conditions.



Reference Type	Electrolyte	Potential mV vs. SHE
Ag/AgCl	Saturated KCl	197
	3.5M KCl	204
	3M KCl	207
	1M KCl	236
	0.1M KCl	292
	Sea Water / 36 PPK	~250
	<1% Sea Water	~370
Ag/Ag ₂ SO ₄	Saturated K ₂ SO ₄	680
	1M H ₂ SO ₄	710
Ag/Ag ₂ O	1.0M NaOH	342
Hg/Hg ₂ Cl ₂	Saturated KCl	244
	3.5M KCl	250
	1M KCl	280
	0.1M KCl	333

WARNING: Mercury and its salts are highly toxic. Ionode advises users to choose silver-based reference electrodes as an alternative. The potential measured vs. a Ag/AgCl electrode can be converted to a value vs. calomel electrode using the table

References

1. "Electrochemical Methods: Fundamentals and Applications", A J Bard and L R Faulkner, John Wiley & Sons, NY (2000). ISBN 0471405213.
2. "Handbook of Reference Electrodes", Inzelt, György, Lewenstam, Andrzej, Scholz, Fritz, Springer, Berlin, Germany (2013). ISBN 9781299694576