

Reference Electrode Potentials @ 25°C

Reference Type	Electrolyte	Potential. mV vs. SHE
Hg/Hg ₂ Cl ₂	Sat. KCl	244
Hg/Hg ₂ Cl ₂	1M KCl	280
Ag/AgCl	Sat. KCl	199
Ag/AgCl	3.5M KCl	205
Ag/AgCl	1M KCl	236
Ag/AgCl seawater	Seawater	Approx 250
Hg/Hg ₂ SO ₄	Sat. K ₂ SO ₄	650
Cu/CuSO ₄	Sat. CuSO ₄	316

Troubleshooting

Symptom	Possible cause	Remedy
Drift	Junction blocked	Remove sleeve. Clean glass stem and sleeve. Refill with electrolyte and replace sleeve.
	Air bubbles in sleeve electrolyte	Remove sleeve and replace electrolyte (see preparation)
Noisy/Off scale	Insufficient electrolyte	Refill electrolyte
	Poor connection	Check connection
	Junction not immersed fully	Lower electrode into solution below junction
	Insufficient electrolyte	Refill electrolyte

Warranty

Ionode electrodes have an expected lifetime of several years in ideal samples at room temperature. Refer to <https://ionode.com/en/support/warranty> for full warranty details.



Contact Ionode or your preferred reseller for information on a range of quality lab supplies including meters, buffers & lab accessories.

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Parameter	Operating Range
Half-cell potential	-44mV ± 10mV with respect to SCE (saturated calomel electrode)
Reference type	Double Junction Ag/AgCl/sat KCl
Temperature range	0 – 60°C
Sleeve electrolyte	KCl gel electrolyte is supplied as standard. Other electrolytes such as sat KCl, KNO ₃ and LiCl in ethanol can be used depending on the application
Body and sleeve	Polypropylene
Overall length	150mm
Barrel diameter	12mm
Cable length	1m standard, longer to order. Maximum 50m
Connector	4mm banana plug standard, others on request

Operators Manual



IJ 14

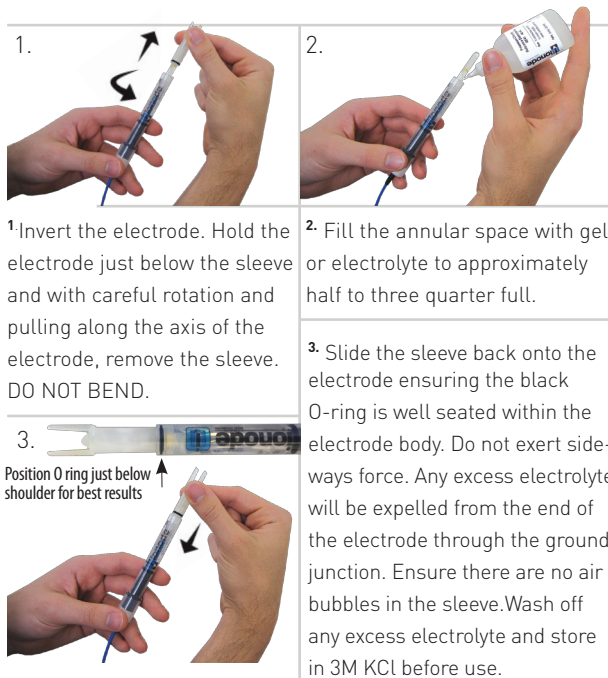
Intermediate Junction Reference Electrode



The IJ14 is a double junction Ag/AgCl reference electrode suited for use with a wide variety of indicator electrodes such as pH, ISE and metal half-cells. The double junction design allows the user to select electrolytes suitable for use with the majority of ion selective electrode half-cells. Suitable electrolytes commonly used include KCl, KNO_3 , NH_4NO_3 , and ethanolic LiCl. The IJ14 can also be used to monitor potentials of various processes such as corrosion.

Preparation

IJ14 series electrodes are shipped without sleeve electrolyte, and must be filled prior to use. To fill, hold the electrode by the sleeve and gently ease off the rubber wetting cap. Prepare as follows:



Electrochemical measurements are relative, which raises the question—what is the correct value?

The standard hydrogen electrode (SHE) has an arbitrarily assigned value of 0.000V. However, the SHE is impractical to use, and in most cases either calomel ($\text{Hg}/\text{Hg}_2\text{Cl}_2/\text{sat KCl}$) or Ag/AgCl/sat KCl electrodes are used.

Helpful Hints

- Select the correct sleeve electrolyte for the application.
- Keep all connections dry.
- Immerse the electrode so that the reference junction is below the liquid surface.
- Minimise contact with sulphide vapours and change the sleeve electrolyte frequently in these conditions.

[illegible]

- When not in use (short term storage), keep the electrode immersed in 3M KCl solution to stabilise junction potentials.
- Replace sleeve electrolyte when necessary.

The frequency of this is best determined by experience, however this should be done more often when measuring contaminated samples.

- For long term storage, remove and clean the sleeve. Replace the sleeve (without electrolyte) and attach the wetting cap.
- DO NOT store the electrode in deionized or distilled water.

Cleanliness of the junction is critical for accurate measurement as drift is often due to an unclean junction. Clean the electrode periodically by removing the sleeve and cleaning the ground glass stem using one of the following methods. DO NOT use abrasive materials.

Soak sensor tip in 1M HNO_3 for 1 hour. Wash well with water and soak in 3M KCl for at least one hour before use.

Method Two: Grease and oil: Wipe the ground stem with cotton or tissue soaked in methylated spirits or isopropanol. Wash well with water and soak in 3M KCl for at least 15 mins before use.