Product Information

Electrode Selection Guide

Sample	Specific Problems	Suitable Electrodes	Additional Notes
Pure Water	Slow response time, noise, drift, non-reproducible and inaccurate.	Low resistance glass pH electrodes, or reference electrode with a fast, continuous leak rate. Both raise the conductivity, but at the same time may change the sample pH at the electrode surface. Response is improved but some degree of error is added.	Calibration of an electrode in a high ionic strength buffer will increase the time required for stabilization when going to a low ionic strength solution. In addition, the possibility of sample contamination will be increased.
Extreme pH/High Salt Content	Drift and slow response as a result of a liquid junction potential.	Double junction reference electrode.	When measuring pH outside the range of 2–12 pH the filling solution of outer chamber should be high pH or low pH. For over 0.1 M ionic strength a strong solution of the same salt is recommended.
Colloids & Suspensions	Slow response time, drift and electrode "fatigue." The ceramic or fibre junction contained in most common combination pH or reference electrodes shows sensitivity to immersion depth in this type of sample.	Sleeve-type liquid junction reference electrodes or combination electrodes with a sleeve-type reference junction minimize the problem and allow easy cleaning.	
Emulsions	Slow response time, drift and electrode "fatigue."	Liquid junction electrodes with ceramic frits often exhibit these faults and changing to a sleeve-type reference electrode may greatly reduce these problems. With high surfactant concentrations it may be necessary to opt for a double junction electrode.	Electrode "fatigue" are attributed to surfactant interaction with, or coating of, the glass electrode. Cleaning regularly with the appropriate cleaning solution will minimize this.

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Non-Aqueous	Unstable readings due to high sample resistance, long response time due to bulb dehydration.	Electrodes with low resistance glass bulbs or add small amount of inert salt (for example, quaternary ammonium salt) to increase conductance of sample. Ensure electrode is frequently soaked in water or pH buffer to rehydrate.	Prevent sample carryover by properly rinsing the electrode with appropriate solvents, then soaking in pH buffer. Keep the results in perspective by comparing to other data based on the same system, instead of aqueous standards. Use as an indicator of relative acidity/basicity instead of actual pH. Changing the fill solution to be compatible with sample will minimize the problem of unequal diffusion of ions causing drift.
Viscous Samples	Stirring difficulties, difficulties in cleaning electrodes, sample carry over, electrode breakage.	Use of separate electrodes, especially of less breakable materials, makes cleaning easier and safer for the electrode.	
Tris, Sulphide & Proteins	Ceramic junction of the reference electrode may become blocked with silver precipitates, causing a slow response or no response at all.	Electrodes that contain no silver in the filling solution OR two-electrode system using an Ag/AgCl reference electrode with a double junction reference electrode.	If using ceramic junction reference electrode soaking in salts (1 M KCl) or acids (0.1 M hydrochloric or nitric) for a period of time may relieve the problem.

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