

Viscous Samples - Too Hard To Handle?

The Problem

If you commonly measure the pH of viscous solutions such as food samples, paint, cosmetics or pastes, you probably find that it is hard to get a stable reading from the meter. Some commonly measured viscous samples are tomato sauce, chili sauce, meat extracts, shampoo, paint, etc. The typical complaint in these applications is that the reading never stabilizes at any point for a reasonable length of time and the variations in the pH can be quite substantial.

Why is the meter reading unstable?

The reason usually is the electrode that you are using is unsuitable for measuring viscous samples (assuming that your meter is working perfectly well). It is not uncommon to find that one pH electrode is used for all kinds of samples in a laboratory. However, pH electrodes have their own specialties and in areas outside these specialties, the electrodes take time to stabilize, and even worse, can be totally unreliable.

What's Wrong?

There's nothing really wrong with the electrode, except that it is probably being used in an application which it is not suited for. For electrodes to work properly, there must be sufficient flow (or a steady leak rate) of the internal solutions into the sample to enable the formation of a complete electrode chain (which in simple terms, enables pH to be measured). Most electrodes are designed to work with very fluid samples, such as water-based solutions. The flow of the internal solutions is designed to be just sufficient for these type of samples. However, when these same electrodes are placed into viscous samples, this flow becomes insufficient to maintain the required electrode chain. This often leads to wild fluctuations in observed readings.

How Can This Problem Be Solved?

The solution is to use an electrode that will allow a higher flow rate of the internal solution without letting it affect the sample reading itself. Two electrodes designed for this application are listed on the following page.

Why This Design?

The design of these electrodes offered below are unique in that:

- The liquid-filled electrodes allow for higher electrolyte flow than gel filled electrodes
- The junctions are designed for a higher flow rate of liquid than typical annular or pin-type junctions
- Both electrodes allow the user to quickly refresh the junction, which removes build-up of viscous fluid. Fast, easy cleaning of the reference port is especially useful for dealing with samples like adhesives or paints where the cleaning of the reference junction is often a problem.

What Are My Options?

The options you have depend largely on the type of samples and also the temperature range that you have. However, for samples where the contamination of the reference junction is a problem (such as those media containing sulfides, iodides, cyanides and bromides) use our double junction electrode. Generally plastic-body double junction electrode is sufficient for most applications, e.g. EC-FC72522.

The glass-body refillable combination pH electrode (EC-FG73711) can withstand higher temperature

tolerance and it allows fresh electrolyte to be refilled. Besides it has a sleeve for easy maintenance. Ideal for high viscosity solutions such as emulsions, suspensions, paints, varnishes, sauces, shampoos and varnishes where frequent cleaning of the reference junction is necessary.

These electrodes can be used together with the following products i.e. pocket testers i.e. [pHScan BNC/pHScanWP BNC](#); handheld meters i.e. [EcoScan pH 5/6](#), [EcoScan Ion 6](#), [CyberScan pH 10/pH100](#), [Waterproof CyberScan pH 300/310](#); bench meters i.e. [CyberScan pH/Ion 510](#), [CyberScan pH 1000/2500](#).

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