

Using Conductivity to Monitor Reflex Dosing in CIP Water

A competitor in the market is offering an acid sanitizer that they claim can be monitored using a simple conductivity probe. Enviro Tech has performed a simple test in the past measuring the conductivity of diluted Reflex samples in reverse osmosis water that indicated that this might be a possibility with our product as well, but no studies have been performed using ordinary process water. Ordinary process water may contain minerals and salts that contribute conductivity to the water and act as background “noise” obscuring measurements.

A sample of process water to be used in a brewery for a CIP wash was shipped to Enviro Tech by Chemstation of St. Louis for testing, and the data presented in Figure 1 was obtained.

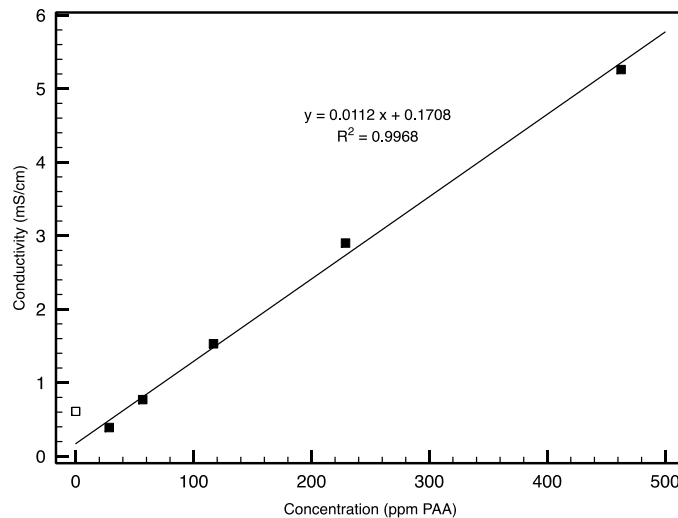


Figure 1

Although it appears that there may be some slight curvature to the data, this may be due to slight degradation of the PAA solution in contact with typical water impurities. A linear regression fits very well for the purposes of this use. The sensitivity of the conductivity to concentration was determined to be 0.0112 mS/cm per ppm PAA, meaning that a change in concentration of 50 ppm PAA would correspond to an increase in conductivity of approximately 0.56 mS/cm. Also note the empty rectangle at $x=0$ – this corresponds to the conductivity of the source water without peracetic acid. It appears that addition of Reflex decreases the conductivity initially, before increasing it linearly, and this may have something to do with the acidity neutralizing water hardness minerals.

It should be stressed, however, that these conductivity values are not absolute. Impurities and hardness of tap water are subject to change, and constitute a significant percentage of the overall conductivity reading, especially at the low end of the range tested. When the concentration of the solution is important, there is no replacement for a peracetic acid-specific test method such as a titration kit.