

Preparing a Water Sample for Iron Testing

Are you aware of the proper way to prepare a water sample for iron testing? When sending in water samples for testing, if you would like to test for iron content, two water samples are required.

One sample of water will be required to test for the following:

- pH
- Total Calcium and Hardness
- Partial and Total Alkalinity
- Conductivity and Total Dissolved Solids
- Chloride
- Manganese
- Silica



An additional sample will be required if you would like to also test for iron content. To accurately test iron content, the 2nd sample of water needs to be acidified to a pH of 2, or slightly below, very shortly after drawing the sample from the source. Nitric acid is the preferred acid to use for acidification. If nitric acid is not readily available, hydrochloric acid can be used. You can use reagent number 10 (2N HCl) from a Hydrite Test Kit. Due to its higher potential iron content, sulfuric acid should not be used. 10-20 drops of acid may be required to lower the pH of the water in the 125ml sample bottle. Verify pH with pH paper or a pH meter.

It is very important to perform a water analysis at each plant to determine the presence and levels of the above contaminants so that proper chemistry (CIP caustic) can be applied to counteract the impurities in the water.

In water wells, iron typically exists in the soluble ferrous (Fe^{2+}) state and has a greenish color. Upon exposure to oxygen (or other oxidizers), the ferrous iron will convert to the ferric (Fe^{3+}) state and precipitate out of solution as iron oxide (Fe_2O_3). Ferric oxide is what causes the brown “rust” staining on the inside surfaces of CIP tanks and other processing equipment.

As little as few ppm iron in the water can cause iron/rust staining. This staining is intensified if chlorine bleach is added to the caustic CIP tank. This staining can be kept in check by the addition of chelants to the caustic wash solution. A common chelant for iron is sodium gluconate. However, sodium gluconate does not become very effective as a chelator until the caustic concentration approaches 1% or greater. For this reason, many times it is necessary to remove the iron from the water prior to it being used for plant sanitation (Greensand filter, RO, softener).

Reach out to the **RITE team** for more information on iron testing and choosing the correct CIP chemistry for your application.