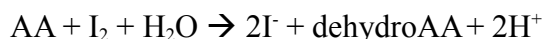


HOW TO CHECK YOUR SYSTEM'S SO₂ REAGENTS

Although we believe the Vinmetrica SO₂ Titrant (and the other reagents) to be stable for at least a year, we occasionally get requests for a way to check the accuracy of results. Since it is impractical to prepare reference standards based on sulfur dioxide (SO₂) or metabisulfite, we provide a somewhat technical version of a procedure you can use to check your system with ascorbic acid or vitamin C.

Ascorbic acid (“AA”, also known as vitamin C) reacts with the Vinmetrica Titrant just as SO₂ does, that is



So you can use pure AA, or a known source of AA, as a relatively accurate standard to determine the strength of your Titrant. Note that since AA is not a “primary standard”, i.e., a certified reference material, this procedure does not provide a precise value for the Titrant strength. Rather, this procedure will give you a result that is good enough to determine whether the reagents and the instrument are working to deliver results within the expected range.

1. Obtain 500 mg tablets of vitamin C. We recommend vitamin C-only tablets, i.e., do not use multivitamins. A good source is Nature's Bounty Pure Vitamin C-500mg, but any similar source will do. (Or send a SASE to Vinmetrica, 1945 Camino Vida Roble, Ste E, Carlsbad, CA 92008 and we will mail you some) If you have pure ascorbic acid, weigh out accurately about 500 mg (i.e., 0.5 g) and note the actual weight.
2. Heat up about 200 mL of distilled or RO water (dH₂O) to boiling for 5 min. A convenient way to do this is to fill a clean coffee mug about 2/3 full and put it in the microwave on high for 5 minutes. [Note: this does 2 things. a) drives out dissolved oxygen which reacts with the ascorbic acid, and b) speeds dissolution of the tablet/ascorbic acid]
3. As soon as possible (i.e., minimize the time allowed to cool) measure out 100 ml of the very hot water into a beaker or flask using a graduated cylinder or other accurate device. In a pinch you can use your 25 ml pipet 4 times. Add the vitamin C tablet or ascorbic acid sample. Stir until dissolved. [Note: some tablets have excipients that may not dissolve. Stir or swirl thoroughly for 2 minutes and then let any solids settle briefly.]
4. If you used a 500 mg tablet, your concentration of ascorbic acid (C) is now about 0.057 meq/mL. If you used different amounts of ascorbic acid or water in step 3, calculate the

concentration of ascorbic acid as

$$C = m / (88 * V_w)$$

where C is the concentration in meq/mL, m is the actual weight (in mg) of the ascorbic acid and V_w is the volume of water (in mL, e.g, 100) used to dissolve it. (Note: The factor 88 is the “equivalent weight” of ascorbic acid in mg/meq)

5. Pipet as accurately as possible 1.0 mL of this solution into the titration vessel. Add about 20 mL dH₂O. Then proceed in the usual manner, i.e., add 2 mL acid reagent and 2 mL reactant solution, then titrate with the Titrant, following from step 4 of the free SO₂ procedure in the User's Manual.
6. Determine the volume of Titrant, V_t (in mL) needed to reach the endpoint. Calculate the normality of the Titrant as

$$\text{Normality 'N' (meq/mL) of Titrant} = C / V_t \quad (\text{i.e., } C, \text{ divided by } V_t)$$

Where C is the concentration of the ascorbic acid in meq/mL determined in step 4; V_t is the mL of titrant to reach the endpoint (assuming you use 1.0 mL in step 5). The expected value is 0.0156 N . If you are within the range 0.0140 to 0.0172, your error in the free SO₂ value will be less than 10%, which should be fine.

We recommend you do this at least two times and average the results. Do not try to use the ascorbic acid solution after 2 hours or so, as it will oxidize slowly in air.