

**A Simple Test for Vitamin C**  
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Many textbooks suggest DCPIP as the reagent to test for vitamin C (ascorbic acid) but I have found that the end point of a titration for this reaction is difficult to ascertain due to the lack of complete decolourisation of the DCPIP.

Whilst participating in a 2001 Science week activity at the Plant Sciences department, Cambridge, I came across an ascorbic acid assay using starch-iodine in place of DCPIP (the source of which was the Thinkquest website). The ability of ascorbic acid to interfere with the starch-iodine reaction has been noted elsewhere, Sharma et al (1990) and Samotus et al (1994)

I have used the following successfully;

Iodine 0.5g dissolved in 100ml of 1% potassium iodide solution (approx  $0.02 \text{ moles dm}^{-3}$  Iodine in  $0.06 \text{ moles dm}^{-3}$  KI)

0.1% Starch solution

1ml of starch is placed in a suitable receptacle and 1 drop of iodine solution added.

The ascorbic acid solution is then added drop wise until the blue-black colour of the starch iodine complex disappear to leave a colourless solution.

The above amounts were completely decolourised by 150 $\mu$ l of 0.05% ascorbic acid and also by a few drops of fresh orange juice.

The ascorbic acid reduces the iodine to iodide so it no longer forms the starch-iodine complex.

Reduction of iodine might also be the mechanism by which rinse aid inhibits the same reaction and thus be related to the findings of Hadi-Talab and Levinson (2000)

I have used this reaction system as a practical assessment for Y12 Biology students using microscale science equipment and a micropipette dispensing 10  $\mu$ l drops; this titration enabled quantitative comparisons to be made.

#### References

Hadi-Talab, R. and Levinson, R, (2000) *Rinse-aid and the starch-iodine reaction* SSR **81** 99-101

Samotus, B., Doerre, E., Swiderski, A., and Scigalski, A., (1994) *Photometric starch-iodine determination in plant materials as influenced by ascorbic acid – critical remarks*. Acta Societatis Botanicorum Poloniae **63** 49-52.

Sharma, S.S., Sharma, S., and Rai, V.K. (1990) *Interference of ascorbic acid with the starch-iodine reaction*. Annals of Botany **65** 281-283

Think Quest <http://library.thinkquest.org/2690/exper/exp28.htm>

#### Safety

Suitable precautions (gloves, goggles) should be taken when weighing out the solid iodine (harmful and corrosive) but once in solution the amounts used are small.

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