

### Product Information Sheet

## T8164

## Triphenyl Tetrazolium Chloride (TTC)

Synonyms: TTC, Tetrazolium chloride, 2,3,5-triphenyltetrazolium chloride  
 CAS: 298-96-4  
 Formula: C<sub>19</sub>H<sub>15</sub>ClN<sub>4</sub>  
 Mol. Weight: 334.8

### Properties

Form: Powder  
 Appearance: White to Off-White  
 Solubility: Soluble in Water  
 Application: Seed Testing  
 Storage Temp: 2-6°C  
 Typical Working Concentration: Varies with application, should be determined by the end user.  
 Other Notes: Somewhat light and heat sensitive, avoid long exposure to light and excessive heat.

### Application Notes

TTC is officially recognized by the International Seed Testing Association, and they provide working sheets (see link in references) for testing different seed types for viability. Tetrazolium chloride is a redox indicator that can differentiate between living and dead tissues based on the reduction of TTC to 1,3,5-triphenylformazan, which is red, by dehydrogenases present in the living tissues. This results in living tissues staining a degree of red, while dead tissues remain unstained.

TTC is most commonly used for seed viability testing, but can also be used with algae species, as demonstrated by Zidarova and Pouneva (2006) with *Choricystis Minor*.

Solutions of TTC (referred to as TZ) are often made using a buffer solution. Two commonly used buffer solutions for making TZ are sodium phosphate (**Prod # S515**) and potassium phosphate (**Prod# P846**):

**Potassium Phosphate Solution:** Dissolve 9.078 g of KH<sub>2</sub>PO<sub>4</sub> in 1000 mL of water.

**Sodium Phosphate Solution:** Dissolve 9.472 g of Na<sub>2</sub>HPO<sub>4</sub> in 1000 mL of water.

Mix two parts of the potassium phosphate solution to one part sodium phosphate solution. Add the appropriate amount of TTC powder to reach the desired concentration. The pH of the solution should be between 6.5-7.5. No pH adjustment should be necessary when using the buffer solution as described. This stock solution should remain viable for approximately 8 months when stored in a clean opaque bottle at 2-6°C (AOSA 2000).

### References

AOSA, 2000. Tetrazolium Testing Handbook. Publication no. 35, Association of Official Seed Analysts, Lincoln NE  
 ISTA website for Tetrazolium Handbook & working sheets: <http://www.seedtest.org/en/product---1--1082--203--21.html>. Accessed 23 July 2012.

Vankus, V (1997) The Tetrazolium Estimated Viability Test for Seeds of Native Plants. In: Landis, T. D.; Thompson, J. R., tech. coords. National Proceedings, Forest and Conservation Nursery Associations. Gen. Tech. Rep. PNW-GTR-419. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 57-62. Available at: <http://www.fcnet.org/proceedings/1997/vankus.pdf>

Zidarova R & I Pouneva (2006) Physiological and Biochemical Characterization of Antarctic Isolate *Choricystis Minor* During Oxidative Stress at Different Temperatures and Light Intensities. *Gen. Appl. Plant Physiology, Special Issue*, pp. 109-115.

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