

Supportive Stability Data for Viral Transport Medium

Our product Viral Transport Medium (Kat. Nr. VTM-(R)-x, x stands for various filling sizes and optionally contains phenol red (R)) follows exactly the formulation published by CDC (Centers for Disease Control and Prevention, USA).

The stability of the product is influenced by its ingredients. Furthermore, the term "stability" needs to be defined more precisely, i.e. it must be considered which aspect of the product's functionality should remain "stable" over time.

Generally the CDC states a stability of 12 months when stored at +2°C to +8°C (see reference document).

However, the product may be also stored at room temperature up to +25°C for a reduced period of time. Stability information on individual ingredients and their functions are lined out below.

The VTM product has two main functions and they are fulfilled by different ingredients:

- 1) **Primary Function:** The ability to keep virological and microbiological samples functionally intact after sampling until further analysis.
 - a. **HBSS (Hank's Balanced Salt Solution):** A buffering solution maintaining a physiological pH and osmolality and contains nutrients (glucose) to keep cells alive.
 - b. **Fetal Bovine Serum Heat Inactivated:** Provides proteins (mainly serum albumins) as well as nutrients and growth promoting factors, which will stabilize the virological and microbiological specimens.
- 2) **Secondary Function:** Suppression of contaminating bacterial and fungal growth.
 - a. **Gentamicin:** Prevents the growth of both Gram positive and Gram negative bacteria.
 - b. **Amphotericin B:** Is an antifungal antibiotic which is most effective against fungi and yeast.
 - c. **Phenol red** (if included) is a pH indicator and can be used as an indirect optical indicator for undesired contamination. The VTM product has a neutral pH and in this range it has an orange-red to slightly pink colour. Should an undesired contamination occur, the resulting metabolic products will generally lead to a lowering of the pH. At low pH the colour changes to yellow and indicates a contamination.

Stability of the individual ingredients at different temperatures:

- 1) **HBSS** (Hank's Balanced Salt Solution) has a shelf life of at least 2 years, some suppliers even state 4 years when stored at room temperature. HBSS has unrestricted stability at refrigerated temperatures (+2°C to +8°C).
- 2) **Fetal Bovine Serum Heat Inactivated** is usually stored frozen and has a shelf life of 5 years when frozen. When thawed the stability is reduced, whereby growth factors are affected first. Albumins, which play the essential role in the product VTM, are stable for many months at refrigerated temperatures and room temperature (up to +25°C). When stored for several months at room temperature, Fetal Bovine Serum Heat Inactivated, will decrease its growth promoting properties, while stabilization of virological and microbiological specimens due to the serum proteins will remain basically unchanged.

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- 3) **Gentamicin** in solution is usually stored frozen and has a shelf life of 2 years. It may be stored at refrigerated temperatures with a reduced shelf life. In formulations such as VTM antibiotics are usually concentrated in abundance so that slight decreases in activity can be compensated by their over-concentration.
- 4) **Amphotericin B** in solution is usually stored frozen and has a shelf life of 2 years. It may be stored at refrigerated temperatures resulting in a reduced shelf life. There is little data available about its stability at room temperature and this available data suggest a rather short stability. It may be possible that a significant amount of this antibiotic will degrade within several weeks. Amphotericin B is concentrated in abundance so that decreases in activity may be at least partly compensated by their over-concentration. Besides temperature control protection from light is pointed out, since this antibiotic seems to be prone to light-induced degradation. That means that the product should be kept away from direct sunlight and stored in its transport cardboard boxes.

Closing conclusions on stability of VTM at room temperature:

- All ingredients that keep virological and microbiological samples functionally intact are stable at room temperature (up to 25°C). A reduction in activity is considered highly unlikely.
- The used antibiotics are more susceptible to higher temperatures. Especially Amphotericin B may suffer a reduction in activity. This may be at least partly compensated by its over-concentration. The second antibiotic, Gentamicin, is more stable at room temperature and is also a highly potent substance to suppress a variety of microbial organisms.
- We consider the medium stable when stored at room temperature. The only risk is a decrease in antibiotic activity over time. Therefore, the use of phenol red is reasonable, as this can indicate contamination by changing colour to yellow.

Help needed?

If you have any further questions regarding this product please do not hesitate to contact our cell culture experts by email (techservice@capricorn-scientific.com) or phone (+49 6424 944640).