



Betaine Enhancer Solution, 5 M Cat #: 42-504

Contents: 5 x 1 ml

Lot Number: See Vial

Concentration: 5 M

Storage: Stored at -20°C.

Reagent for *in vitro* laboratory use only

General Description

Betaine Enhancer Solution is one of the most effective additives over a wide range of different templates, including GC-rich sequences and templates known to be extremely difficult to amplify. The performance of Betaine Enhancer Solution is superior compared to standard enhancers such as formamide, DMSO, TMAC, BSA and non-ionic detergents. Betaine Enhancer Solution is an excellent enhancer especially when used with GC-rich regions or templates with a high degree of secondary structures.

The Function of Betaine Enhancer Solution

Betaine enhancer solution lowers the DNA melting temperature and has an enhancing effect on the polymerase.

In detail, Betaine binds preferentially to AT rich sequences in the major groove, thereby stabilizing AT rich regions of the DNA. Because AT forms 2 hydrogen bonds and GC forms 3, the bonding of AT is less stable than the one of GC. Because of the stabilizing effect of Betaine on AT bonding, the stability of AT bonding and GC bonding is brought close to an equal level. At the same time, Betaine has a sequence independent destabilizing effect on all DNA. Summarized, the T_m of AT rich and GC rich sequences are equalized, and the overall T_m is lowered.

Furthermore, Betaine aids the processivity of thermostable polymerases and reduces "pauses" in polymerization caused by secondary structure that can induce the polymerase to disassociate from the DNA strand.

Pre-PCR Considerations

Betaine has a decreasing effect on the melting temperature of DNA and primers. Therefore, denaturation temperatures as well as primer annealing temperatures should be reduced by 1 – 5 °C. The optimal annealing temperature should be determined individually for each reaction.

Kit Components

Betaine Enhancer Solution

5 M Betaine in solution in PCR-grade H₂O