

dNTP Set, 10mM of each

Cat # N023

Pack Size: 1mL

Storage: -20°C

**Kit Contents:**

S.No	Components	Concentration	Volume
1	dATP	10mM	250 µL
2	dCTP	10mM	250 µL
3	dGTP	10mM	250 µL
4	dTTP	10mM	250 µL

Introduction

A dNTP set, 10 mM of each, is a reagent used in molecular biology that contains a set of four deoxyribonucleoside triphosphates (dNTPs): dATP, dCTP, dGTP, and dTTP, each at a concentration of 10 mM. These are the building blocks of DNA, and they are essential for many molecular biology techniques, such as PCR, DNA sequencing, and DNA labeling.

dNTPs are the basic raw materials that DNA polymerases use to synthesize new strands of DNA. During DNA replication and amplification processes, the DNA polymerase adds the dNTPs in a specific order, according to the template DNA strand, to create a new complementary strand of DNA. Therefore, the use of high-quality dNTPs is critical for the success of many molecular biology techniques.

The concentration of dNTPs in the reaction mixture is crucial for the efficient and specific synthesis of DNA. A low concentration of dNTPs can lead to incomplete synthesis of the DNA strand, while a high concentration can cause misincorporation of nucleotides, leading to errors in the amplified product. Therefore, the use of dNTP sets with a known concentration is essential to ensure optimal results.

The dNTPs in the set are typically manufactured using enzymatic methods. Ribonucleotides are converted to deoxyribonucleotides by the enzyme ribonucleotide reductase. The deoxyribonucleotides are then phosphorylated to form dNTPs by the enzyme nucleoside kinase. The resulting dNTPs are purified using chromatographic methods to remove impurities and ensure high purity.

Product Source

Enzymatic production

Concentration

10 mM of each nucleotide (dATP, dCTP, dGTP, and dTTP)

Purity

>99%

Protocol

When all four dNTPs are mixed together in equal volume at a concentration of 10 mM each, the final concentration of each dNTP in the mixture is 2.5 mM each. To prepare a PCR reaction, the optimal concentration of dNTPs in the final reaction mix depends on the specific application and the type of DNA polymerase used. Generally, a concentration of 200 µM each of dATP, dCTP, dGTP, and dTTP is commonly used in PCR reactions.

1. Determine the volume of PCR reaction mix required for the experiment.
2. Calculate the amount of each dNTP required based on the desired final concentration and the volume of the PCR reaction mix. For example, for a final concentration of 200 µM each of dNTP in a 50 µl PCR reaction mix, add 4 µl of a 2.5 mM dNTP mix.
3. Add the required volume of dNTP mix to the PCR reaction mix and mix well.
4. Proceed with the PCR reaction as per the standard protocol.