

KOD-plus Polymerase

1. Description

DNA polymerase from *Thermococcus kodakaraensis* KOD is one of the most efficient thermostable PCR enzymes exhibiting higher accuracy and elongation velocity than any other commercially available DNA polymerase. The enzyme catalyzes the template-dependent polymerization of nucleotides into duplex DNA in the 5'=>3' direction. The *KOD* DNA Polymerase also exhibits 3'=>5' exonuclease (proofreading) activity, that enables the polymerase to correct nucleotide incorporation errors. It has no 5'=>3' exonuclease activity.

2. Source

KOD DNA Polymerase (native) - *Thermococcus kodakaraensis* cells.

KOD DNA Polymerase (recombinant) - *E.coli* cells with a cloned *pol* gene from *Thermococcus kodakaraensis*.

3. Molecular Weight

91 kDa monomer

4. Features

PCR amplification of DNA fragments as long as 6 kb, 30sec/kb

Eight times more accurate than *Taq* DNA polymerase.

Highly thermostable - remains 95% active after 2 hours incubation at 95°C.

Generates blunt-end PCR products.

5. Applications

All PCR amplification which demand high fidelity

Primer extension

High fidelity PCR for cloning into blunt-ended vectors

Site-directed mutagenesis

6. KOD DNA Polymerase Storage Buffer

50 mM Tris-HCl (pH 8.0), 50 mM KCl, 1 mM DTT, 0.1 mM EDTA, stabilizers, and 50% (v/v) glycerol.

7. Reaction buffer

1200mM tris-HCl,15mM MgSO₄,100mM KCl,60mM (NH₄)₂SO₄,1% Triton-100
1mg/ml BSA

8. Unit Definition

One unit of KOD DNA Polymerase incorporates 10 nmol of deoxyribonucleotide into acid-precipitable material in 30 min at 74°C.

9. Quality Control

The absence of endodeoxyribonucleases and exodeoxyribonucleases confirmed by appropriate quality tests. Functionally tested in PCR.

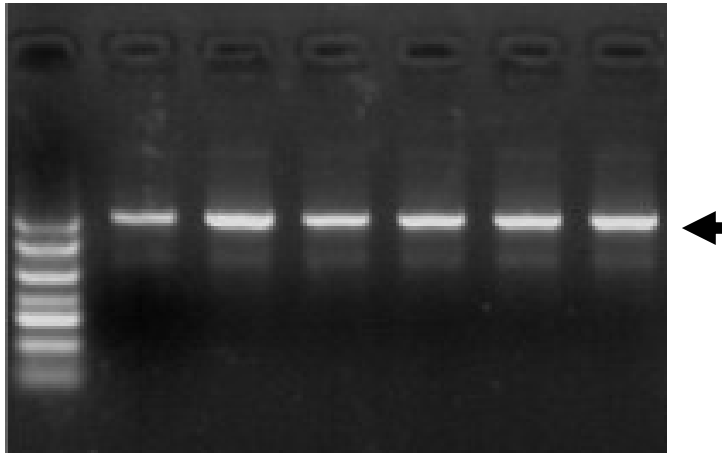
10. Storage

-20°C

11. PCR example for 50µl system

Kod DNA polymerase	0.5 Unit
Reaction buffer	5µl
dNTP(10mM)	2µl
Primer forward	0.2-1u mol/µl
Primer reverse	0.2-1u mol/µl
Templete	10-500pg/1µl
H ₂ O	40µl

PCR procedure (amplify 2Kb target product)
94 °C 5min, 94 °C 30sec,55 °C 30sec,70 °C 35sec,30 cycle,70 °C
5min
1kbM 3µlproduct.



12. Notes

The error rate of *KOD* DNA Polymerase in PCR is 2.6×10^{-6} errors per nt per cycle. Accordingly, the accuracy of PCR is 3.8×10^5 . Accuracy is an inverse of the error rate and shows an average number of correct nucleotides incorporated before an error occurs.

The *KOD* DNA Polymerase has no detectable reverse transcriptase activity.