Cellulase

Cellulase is produced by microbial fermentation technology, and advanced post-processing techniques. It is composed of multiple ingredients and can degrade cellulose fibers to simple sugars efficiently.

Definition of Activity

One unit of cellulase is defined as the quantity of enzyme, which liberates 1μmol of reducing sugar from 4.0mmol/L sodium carboxymethyl cellulase substrate at 37℃ and pH5.5 in 1min.

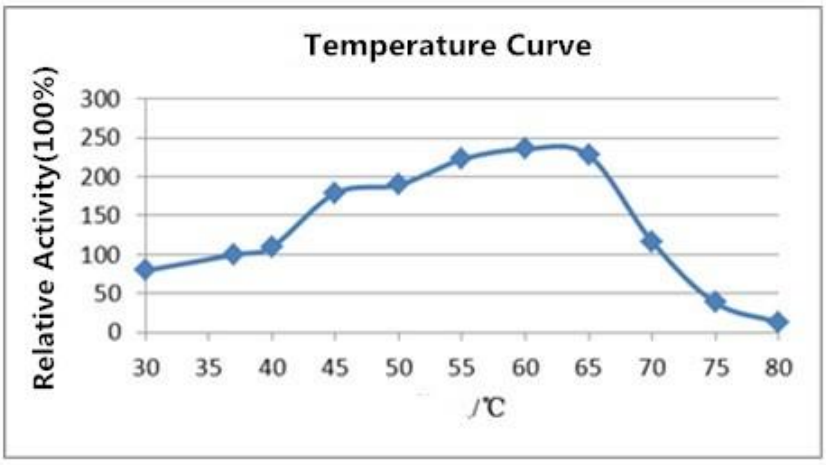
Mechanism

Cellulase is a high-polysaccharides made of glucopyranose by β-1,4-glycosidic bond. Cellulase system consists of three major components: Endoglucanases (EG), cellobiohydrolases (CBH,), and β-glucosidases (βG). EG acts on insoluble cellulose surface, breaks internal bonds to disrupt the crystalline structure of cellulase and expose individual cellulase polysaccharide chains, and makes cellulose chains hydration easily. CBH cleaves 2-4 units from the ends of the exposed cellulose chains produced by EG. βG hydrolyses the CBH product into individual monosaccharides. Through the synergistic action of above enzyme system, cellulose can be efficiently hydrolyzed to glucose.

Product Characteristics

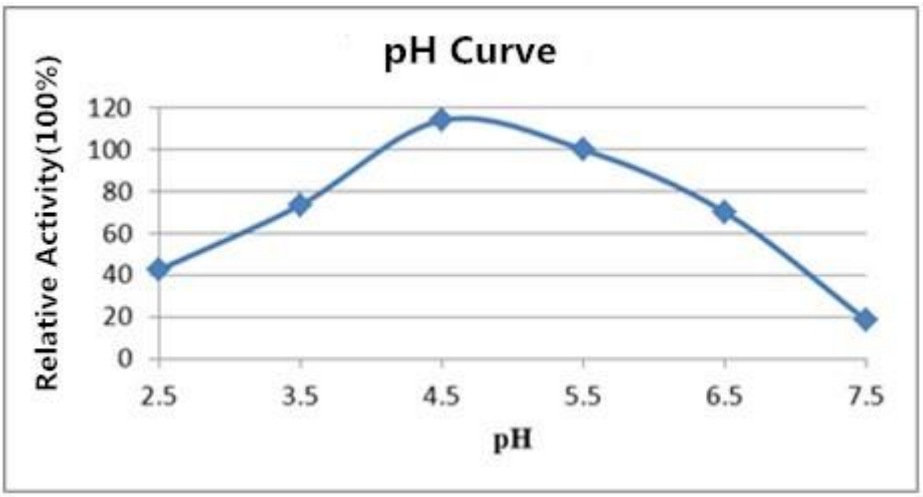
1. Full –scale enzyme profile (EG, CBH and β-G) ensures the efficient degradation of cellulose.
2. High Activity in 35℃ - 70℃, the optimal temperature is 60℃.

Figure.1 Cellulase Temperature Curve



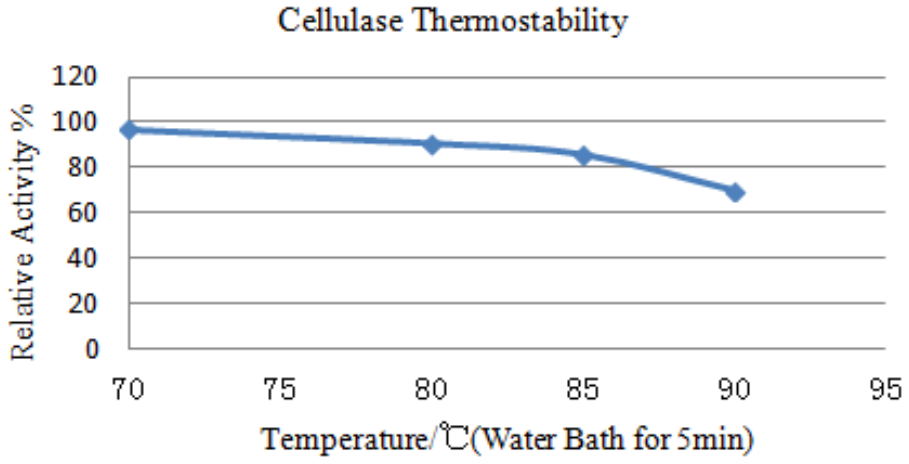
3. High Activity in pH3.5-6.5, the optimal pH is 4.5.

Figure.2 Cellulase pH Curve



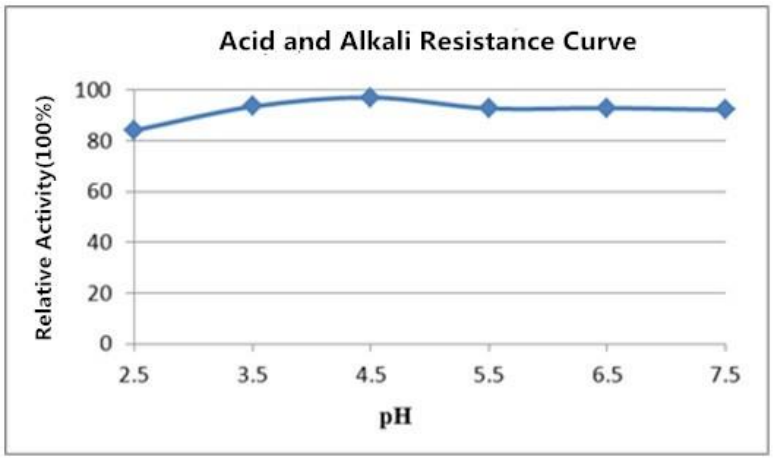
4. Good thermostability in 70℃ – 90℃.

Figure.3 Cellulase Thermostability Curve



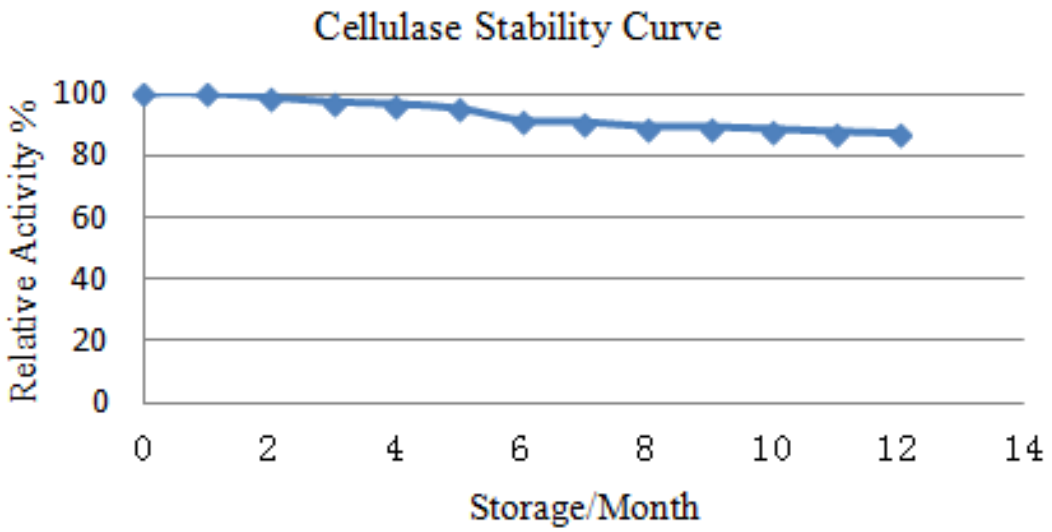
5. Good acid and alkali resistance, the residual activity is over 80% in different pH condition.

Figure.4 Cellulase Acid and Alkali Resistance Curve



6. High storage stability, easy to transport, process and store. The activity can keep over 85% after 12 months storage under room temperature.

Figure.5 Cellulase Stability Curve



7. Less sensitive to the influence of metal ions

Table.1 The Effect of Metal Ion on the activity of Cellulase

Metal Ion	Concentration C/mol. L^{-1}	Relative activity/%	Evaluation
Fe^{2+}	10^{-3}	87.53	-
Ca^{2+}	10^{-3}	96.31	-
Mn^{2+}	10^{-3}	92.78	0
Cu^{2+}	10^{-3}	107.52	0
Zn^{2+}	10^{-3}	101.40	0
Comparison	/	100	0

Note: + refers to activation; - refers to inhibition; 0 refers to no obvious impact (the effect on enzyme activity is within 10%)

Specification

Type	Activity
Powder	10,000U/g, 20,000U/g，**40,000U/g**
Liquid	10,000U/mL, 20,000U/mL

Package and Storage

Packaging: Solid: 25 kg /bag; Liquid: 30 kg/plastic barrel

Store under sealed, room temperature (less than 25℃) condition for 12 months in original package (liquid:6 months)

Avoid being exposed to the sun, rain, high temperature and high humidity.

Technical Service

Offer cellulase usage formula, enzyme activity test and related product technical service to ensure the using result.