Cystathionine Beta-Synthase

PREPARATION and SPECIFICATION

Appearance: Yellowish powder, lyophilized

Source: Microorganism

Enzyme Commission Number: EC 4.2.1.22

CAS Number: 9023-99-8

Activity: ≥ 5 U/mg-solid

Specific activity: ≥ 13.3 U/mg-protein

Storage at -20 ℃

Unit definition: One unit causes is defined as the amount of enzyme that catalyzes the formation of one micromole of L-cystathionine per min at pH 8.0 at 37 ℃

PROPERTIES

Molecular weight: *ca*. 43 kDa (SDS-PAGE)

Stability (powder form): Stable at 30 ℃ for at least 28 days

Stability (liquid form with stabilizers): stable at 37 ℃ for at least two weeks

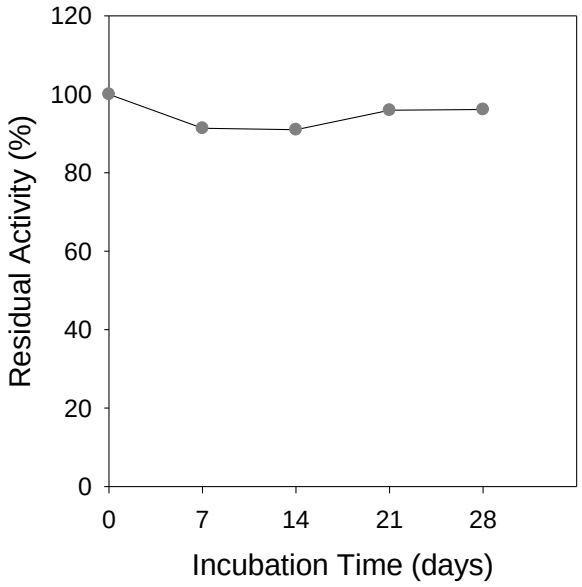

Fig.1 Stability of powder form

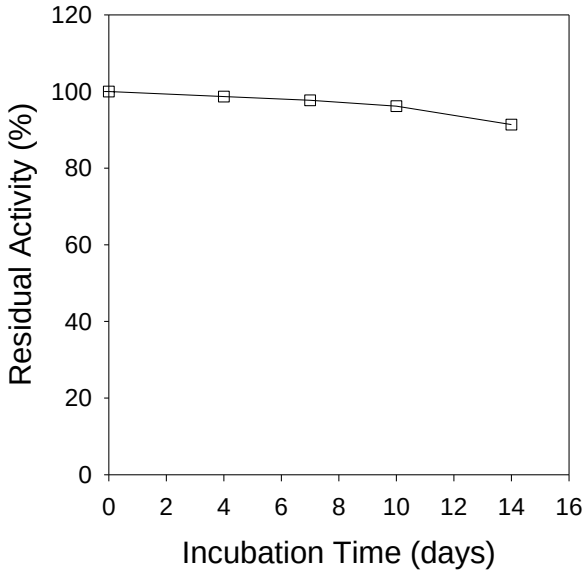

Fig.2 Stability of CBS dissolved in liquid form with stabilizers

APPLICATION

Accuracy: Relative biases <7%. (Table.1)

Precision: Coefficient of variation <1% (Table.2)

Clinical comparison: Correlation coefficient >0.99（Fig.3）

This enzyme is useful for enzymatic determination of L-homocysteine when coupled with cystathionine beta-synthase and lactate dehydrogenase in clinical analysis. CUSAg HCY biochemical regent was performed by in-house cystathionine beta-synthase and cystathionine beta-lyase.

Step 1: L-Homocysteine + L-serine $\xrightarrow{\text{CBS}}$ L-Cystathionine

Step2: L-Cystathionine $\xrightarrow{\text{CBL}}$ L-Homocysteine + NH_3+ Pyruvate

Step 3: Pyruvate + NADH $\xrightarrow{\text{LDH}}$ Lactate + NAD^+

The rate of NADH conversion to NAD+ (measured at A340 nm) is directly proportional to the concentration of homocysteine.

Table.1 Accuracy of CUSAg HCY biochemical assay (Two levels of homocysteine (HCY) controls were analyzed in replicates of three on the CUSAg biochemical platform, in which the enzymatic cycling-based regents were prepared with our self-development cystathionine beta-synthase.**)**

HCY Control	Determined Con. (mg/L)			Mean Con. (mg/L)	Bias (%)
Control 1 (12.0 μmol/L)	12.7	12.9	12.9	12.8	6.7
Control 2 (29.0 μmol/L))	30.2	30.4	30.6	30.2	4.0

Table.2 CUSAg HCY biochemical assay precision profile. (The precision profile was determined with 1 serum pool levels using a single lot of reagents, in replicates of ten on the CUSAg biochemical platform.)

Panel Member	n	Mean Conc. (mg/L)	SD	%CV
1	10	13.0	0.09	0.7

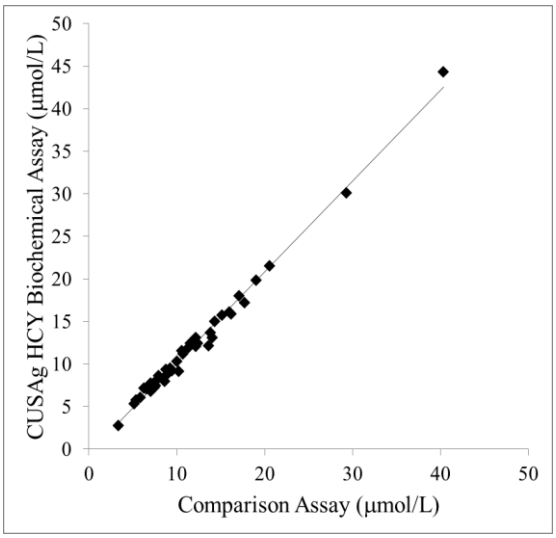

Fig.3 Method comparison Passing Bablok regression plot between CUSAg HCY and commercial diagnostic kit (In order to meet the application of CUSAg cystathionine beta-synthase on biochemical platform, 50 serum samples were separately tested using CUSAg in-house HCY biochemical regent and compared to a commercial diagnostic kit. The correlation coefficient between the two systems was over 0.99.**)**