Enzyme Assay Units

Amylase Units

DU: One α-amylase dextrinizing unit is defined as the quantity of α-amylase that will dextrinize soluble starch in the presence of an excess of β-amylase at the rate of 1 g/h at 30°C. The degree of hydrolysis is determined by comparing the iodine color of the hydrolysate with that of the standard. (FCCVIII)

Cellulase Units

CU: One cellulase unit is defined as the amount of activity that will produce a relative fluidity change of 1 in 5 minutes in a defined carboxymethyl cellulose substrate under the conditions of the assay (pH4.5 and 40°C). The degree of hydrolysis of the interior β-1,4-glucosidic bonds correspond to a reduction in substrate viscosity which is determined using a calibrated viscometer. (FCCVIII)

β-Glucanase Units

BGU: One β-glucanase unit is defined as that quantity of enzyme that will liberate reducing sugar (as glucose equivalence) at a rate of 1μmol/minute under the conditions of the assay (pH 6.5 and 40°C). The hydrolysis of the lichenin substrate leads to an increase in reducing power due to liberated reducing groups and is measured by the neocuproine method. (FCCVIII)

Glucoamylase Units

AGU: One unit of glucoamylase activity (Amyloglucosidase) is defined as the amount of glucoamylase that will liberate 0.1μmol/minute of p-nitrophenol from the p-nitrophenyl-α-D-glucopyranoside (PNPG) solution under the conditions of the assay (pH 4.3 and 50°C). The PNPG liberated is measured against a quantity of a standard preparation of PNPG spectrophotometrically. (FCCVIII)

Lactase Units

ALU: One lactase unit is defined as that quantity of enzyme that will liberate o-nitrophenol at a rate of 1μmol/minute under the conditions of the assay (pH 4.5 and 37°C). The hydrolysis of the o-nitrophenyl-β-D-galactopyranoside substrate is measured spectrophotometrically. (FCCVIII)

Lipase Units

LU: One lipase unit is defined as the quantity of enzyme that will liberate 1 μmol of butyric acid per minute under the conditions of the test (pH 7.0 and 30°C). The assay is based on the potentiometric measurement of the rate at which the preparations will catalyze the hydrolysis of tributyrin. (FCCVIII)

FIP: One unit of enzyme activity is defined as that quantity of a standard lipase preparation (Fungi Lipase-International FIP Standard) that liberates the equivalent of 1μmol of fatty acid per minute from the substrate emulsion under the described assay conditions (pH 7.00 and 37°C). The assay is based on the measurement of the amount of free fatty acids formed from an olive oil emulsion in the presence of sodium taurocholate over a fixed time interval. (FCCVIII)

Papain Units

PU: One papain unit is defined as that quantity of enzyme that liberates the equivalent of 1μg of tyrosine per hour under the conditions of the assay (pH 6.0 and 40°C). Unhydrolyzed casein substrate is precipitated with trichloroacetic acid and removed by filtration so the solubilized casein can be measured spectrophotometrically. (FCCVIII)

Hemicellulase Units

HCU: One hemicellulase unit is defined as that activity that will produce a relative fluidity change of 1 over a period of 5 minutes in a locust bean gum substrate under the conditions specified (pH 4.5 and 40°C). The test is based on the enzymatic hydrolysis of the interior glucosidic bonds of the locust bean gum substrate measured by the reduction of viscosity with a calibrated viscometer. (FCCVIII)

XU: One xylanase unit is defined as the amount of enzyme which liberates 1μmol of xylose per minute under the conditions of the assay (pH 5.3 and 50°C). The assay is based on a 5 minute hydrolysis of xylan substrate which is stopped by the addition of dinitrosalicylic acid. The hydrolyzed xylose is measured spectrophotometrically.

Diastase Units

DP°: One unit of diastase activity, expressed as degrees diastatic power, is defined as that amount of enzyme contained in 0.1mL of a 5% solution of the sample enzyme preparation that will produce sufficient reducing sugars to reduce 5mL of Fehling's solution when the sample is incubated with 100mL of the substrate for 1 hour at 20°C. The reducing sugar groups produced from the hydrolysis of a starch substrate are measured in a titrimetric procedure using alkaline ferricyanide. (FCCVIII)

Fungal Protease Units

HUT: One HUT unit of proteolytic activity is defined as that amount of enzyme that produces a hydrolysate whose absorbance at 275nm is the same as that of a solution containing 1.10μg/mL of tyrosine in 0.006N hydrochloric acid in 1 minute under the conditions of the assay (pH 4.7 and 40°C). The quantity of the solubilized hemoglobin substrate in the filtrate is determined spectrophotometrically. (FCCVIII)

SAPU: One spectrophotometric acid protease unit is that activity that will liberate 1μmol of tyrosine per minute under the conditions specified (pH 3.0 and 37°C). The assay is based on the enzymatic hydrolysis of a casein substrate in which the solubilized casein filtrate is determined spectrophotometrically. (FCCVIII)

Invertase Units

SU: One Sumner Unit is the quantity of enzyme which will convert 1mg of sucrose to glucose and fructose in 5 minutes under the conditions of the assay (pH 4.5 and 20°C). The amount of monosaccharides produced by hydrolysis of the sucrose substrate is measured spectrophotometrically using a 3,5-Dinitrosalicylic Acid acid-phenol reagent correlated to a glucose standard. (FCCVIII)

Phytase Units

FTU: One phytase unit is the amount of enzyme that liberates inorganic phosphate at 1μmol/min from sodium phytate 0.0051mol/L under the conditions of the assay (pH 5.50 and 37°C). The assay is an enzymatic hydrolysis of sodium phytate, measured by the amount of ortho phosphate released. (FCCVIII)

Bacterial Protease Units

PC: One bacterial protease unit is defined as that quantity of enzyme that produces the equivalent of 1.5μg/mL of L-tyrosine per minute under the conditions of the assay (pH 7.0 and 37°C). The assay is a proteolytic hydrolysis of casein in which the unhydrolyzed casein is removed by filtration and the solubilized casein is determined spectrophotometrically. (FCCVIII)

α-Galactosidase Units

GalU: One α-galactosidase activity unit is defined as the quantity of the enzyme that will liberate p-nitrophenol at the rate of 1μmol/minute under the conditions of the assay (pH 5.5 and 37°C). The amount of p-nitrophenol liberated from the hydrolysis of the p-nitrophenyl-α-D-galactopyranoside substrate is measured spectrophotometrically. (FCCVIII)

Pancreatin Amylase Units

One USP Unit of amylase activity is contained in the amount of pancreatin that decomposes starch at an initial rate such that 0.16 μ Eq of glycosidic linkage is hydrolyzed per minute under the conditions of the assay (pH 6.8 and 25°C). The amount of 0.1 N sodium thiosulfate consumed in the titration of a soluble starch substrate is measured and compared to the USP reference standard. (FCCVIII)

Pancreatin Protease Units

One USP Unit of protease activity is contained in the amount of pancreatin that hydrolyzes casein at an initial rate such that there is liberated per minute an amount of peptides not precipitated by trichloroacetic acid that gives the same absorbance at 280nm as 15nmol of tyrosine under the conditions of the assay (pH 7.5 and 40°C). The hydrolysate from the casein substrate is measured spectrophotometrically and compared to the USP reference standard. (FCCVIII)

Pancreatin Lipase Units

One USP Unit of lipase activity is contained in the amount of pancreatin that liberates 1.0 μEq of acid per minute under the conditions of the assay (pH of 9.0 and 37°C). The amount of 0.1N sodium hydroxide titrated to keep the olive oil/acacia emulsion substrate at pH 9.0 is measured and compared to the USP reference standard. (FCCVIII)

Serratiopeptidase Units

SPU: One unit of serratiopeptidase activity is that activity which produced 1μg of tyrosine per minute under the conditions of the assay (pH 7.0 and 37°C). The hydrolysis of a casein substrate is stopped by the addition of trichloroacetic acid and the precipitated casein is filtered out in order to measure the hydrolysate spectrophotometrically.

Pectinase Units

endo-PGU: One pectinase unit is the quantity of enzyme which produces reducing sugars equivalent to the reducing power of 1μmol of sodium thiosulfate in 30 minutes under the conditions of the assay (pH 4.0 and 40°C). The assay is based on the hydrolysis of the polygalacturonic acid substrate measured by titration.

Bromelain Units

GDU: One gelatin digestion unit per gram of bromelain is that amount of enzyme which liberates 1mg of amino nitrogen from a gelatin substrate in 20 minutes under the conditions of the assay (pH 4.5 and 45°C). The hydrolyzed gelatin substrate liberates amino acids and peptides which are measured by titration with sodium peroxide.

Alkaline Protease Units

APU: One unit of alkaline protease is defined as that amount of enzyme needed to produce an absorbance at 660nm that corresponds to the absorbance of 1μg of tyrosine per minute under the conditions of the assay (pH 8.0 and 30°C). The assay is based on a 10 minute hydrolysis of Hammerstein Casein in which the hydrolysate is measured spectrophotometrically.

Dextranase Units

DEXU: One dextranase unit is that quantity of enzyme, which produces reducing sugars equivalent to the reducing power of one micromole of sodium thiosulfate in 30 minutes under the conditions of the assay (pH 5.8 and 37°C). The assay is based on a 30 minute hydrolysis of Casein following the Hanes potassium ferricyanide method and measured by titration.

DPPIV Units

PANU: One dipeptidyl peptidase IV unit will produce 1.0 μmole of p-nitroaniline from Gly-L-Pro p-nitroanilide per minute in 100 mM Tris-HCl under the conditions of the assay (pH 7.6 at 37 °C). The assay is based on the hydrolysis of Gly-L-Pro p-nitroanilide in which the hydrolysate is measured spectrophotometrically.

Lysozyme Units

One lysozyme unit is defined as the amount of lysozyme that causes a decrease in absorbance of 0.001 per minute at 450nm using a suspension of the substrate *Micrococcus lysodeikticus* under the conditions of the assay (pH 6.2 and 25°C). The assay is based on the lysis of the substrate, which is measured spectrophotometrically.

Catalase Units

Baker: One baker unit is defined as the amount of catalase that will decompose 264mg of hydrogen peroxide under the conditions of the assay (pH 7.0 and 25°C). The assay is an exhaustion method based on the breakdown of the hydrogen peroxide by the catalase and the catalase by the hydrogen peroxide, measured titrimetrically.

Transglucosidase Units

TGU: One transglucosidase unit corresponds to that amount of enzyme that produces 1 μg of glucose in 60 minutes under the conditions of the assay (pH 5.0 and 40°C). The assay is based on a 60 minute hydrolysis of methyl-D-glucoside, measured spectrophotometrically.

Nattokinase Units

FU: One fibrin degradation unit is that amount of enzyme which liberates 1 μmol of p-Nitroaniline per minute under the conditions of the assay (pH 8.5 and 37°C). The assay is based on a 60 minute hydrolysis of a fibrin substrate in which the hydrolysate is measured spectrophotometrically.

Flavozyme Units

FLU: One β-glucosidase activity unit is defined as the quantity of enzyme that will liberate p-nitrophenol at the rate of 1nmol per minute under the conditions of the assay (pH 7.5 and 30°C). The assay is based on an 8 minute hydrolysis of p-nitrophenyl-β-D-glucopyranoside, in which the liberated p-nitrophenol is measured spectrophotometrically. (FCCVIII)

Trypsin Units

One USP trypsin unit is the activity causing a change in the absorbance of 0.003 per minute under the conditions of the assay (pH 7.6 and 25°C). The assay is a 5 minute hydrolysis of N-benzoyl-L-arginine ethyl ester hydrochloride measured spectrophotometrically. (FCCVIII)

Chymotrypsin Units

One USP chymotrypsin unit is defined as the activity causing a change in absorbance at the rate of 0.0075nm per minute under the conditions of the assay (pH 7.0 and 24°C). The assay is a 5 minute hydrolysis of N-acetyl-L-tyrosine ethyl ester measured spectrophotometrically. (FCCVIII)

Lumbrokinase Units

LKU: One lumbrokinase unit is that amount of enzyme needed to liberate 1μmol of p-nitroaniline per minute under the conditions of the assay (pH 9.2 and 25°C). The assay is a 60 minute hydrolysis of the synthetic substrate, Chromozyme TH, where the liberated p-nitroaniline is measured spectrophotometrically.

Pepsin Units

One pepsin unit is defined as that quantity of enzyme that digests 3,000 times its weight of coagulated egg albumen under the conditions of the assay (52°C).

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