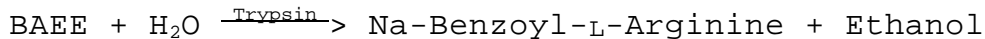


**Enzymatic Assay of TRYPSIN TPCK/DITC GLASS
(EC 3.4.21.4)**

PRINCIPLE:



Abbreviation used:

BAEE = Na-Benzoyl-L-Arginine Ethyl Ester

CONDITIONS: T = 25°C, pH = 7.6, A_{253nm}, Light path = 1 cm

METHOD: Spectrophotometric Rate Determination

REAGENTS:

- A. 400 mM Sodium Phosphate Buffer, pH 7.6 at 25°C
(Prepare 100 ml in deionized water using Sodium Phosphate, Dibasic, Anhydrous, Sigma Prod. No. S-0876. Adjust to pH 7.6 with 1 M HCl.)
- B. 0.26 mM Na-Benzoyl-L-Arginine Ethyl Ester Solution (BAEE)
(Prepare 50 ml in Reagent A using Na-Benzoyl-L-Arginine Ethyl Ester, Hydrochloride, Sigma Prod. No. B-4500.)
- C. Trypsin Enzyme Standard Solution (STD)
(Immediately before use, prepare a solution containing 0.01 mg/ml of Trypsin, Sigma Prod. No. T-8642, in cold Reagent A.)
- D. Trypsin Insoluble Enzyme (Trypsin/DITC)
(Use Trypsin, TPCK Bound to DITC glass, Sigma Prod. No. T-8899.)

PROCEDURE:

Step 1: Standard Determination

Pipette (in milliliters) the following reagents into suitable containers:

	<u>Standard</u>	<u>Blank</u>
Reagent B (BAEE)	3.10	3.10

**Enzymatic Assay of TRYPsin TPCK/DITC GLASS
(EC 3.4.21.4)**

PROCEDURE: (continued)

Equilibrate to 25°C. Then add:

	<u>Standard</u>	<u>Blank</u>
Reagent C (Std)	0.10	-----
Reagent A (Buffer)	-----	0.10

Immediately mix by inversion and incubate at 25°C for exactly 1.5 minutes. Record the A_{253nm} for the Standard and Blank using a suitably thermostatted spectrophotometer.

Step 2: Sample Determination

Weigh (in milligrams) the following reagent into a suitable container.

	<u>Test</u>	<u>Blank</u>
Reagent D (Trypsin/DITC)	5-10	-----

Pipette (in milliliters) the following reagents into suitable containers:

Reagent A (Buffer)	0.10	0.10
Reagent B (BAEE)	3.10	3.10

Immediately vortex at a medium speed for exactly 1.5 minutes. Then filter the Test and Blank through a 0.45 μ m syringe filter. Record the A_{253nm} for both the Test and Blank filtrate using a suitable spectrophotometer.

CALCULATION:

Standard:

$$\text{Units/ml enzyme} = \frac{(A_{253nm} \text{ Test} - A_{253nm} \text{ Blank})(df)}{(0.001)(1.5)}$$

df = Dilution factor

0.001 = The change in A_{253nm} /minute per unit of Trypsin at pH 7.6 at 25°C in a 3.2 ml reaction mixture

1.5 = Time (in minutes) of assay

**Enzymatic Assay of TRYPsin TPCK/DITC GLASS
(EC 3.4.21.4)**

CALCULATION: (continued)

$$\text{Units/mg solid} = \frac{\text{units/ml enzyme}}{\text{mg solid/ml enzyme}}$$

Compare the activity of the standard to its release value (activity). This is to ensure that the assay is functioning correctly.

Test:

$$\text{Units/g enzyme} = \frac{(\text{A}_{253\text{nm}} \text{ Test} - \text{A}_{253\text{nm}} \text{ Blank})(1000)}{(0.001)(1.5)(\text{mg Trypsin bound to DITC glass})}$$

1000 = Conversion from mg to g

0.001 = The change in $\text{A}_{253\text{nm}}$ /minute per unit of Trypsin at pH 7.6 at 25°C in a 3.2 ml reaction mix

1.5 = Time (in minutes) of assay

UNIT DEFINITION:

One BAE unit will produce a $\Delta\text{A}_{253\text{nm}}$ of 0.001 per minute with BAE as substrate at pH 7.6 at 25°C in a reaction volume of 3.2 ml.

FINAL ASSAY CONCENTRATION:

In a 3.2 ml reaction mix, the final concentrations are 400 mM sodium phosphate, 0.25 mM Na-benzoyl-L-arginine ethyl ester, 5 - 10 mg of trypsin, TPCK bound to DITC glass.

REFERENCE:

Bergmeyer, H.U., Gawehn, K., and Grassl, M. (1974) in *Methods of Enzymatic Analysis* (Bergmeyer, H.U. ed.) Volume I, 2nd ed., 515-516, Academic Press Inc., New York NY

NOTES:

1. This assay is based on the cited reference.
2. Where Sigma Product or Stock numbers are specified, equivalent reagents may be substituted.

**Enzymatic Assay of TRYPSIN TPCK/DITC GLASS
(EC 3.4.21.4)**

This procedure is for informational purposes. For a current copy of Sigma's quality control procedure contact our Technical Service Department.