

Phenylalanine Deamination

The enzyme **phenylalanine deaminase** catalyzes the removal of the amino group ($-NH_2$) from the amino acid phenylalanine (Fig. 6-80, p. 74 of the Atlas). The resulting products include the organic acid phenylpyruvate, water and ammonia. Certain enteric bacteria (e.g. *Proteus*, *Morganella* and *Providencia*) can use the phenylpyruvate in biosynthesis reactions. In addition the deamination detoxifies inhibitory amines.

The **phenylalanine deaminase test** can be used to differentiate among enteric bacteria such as *Escherichia coli* and *Proteus vulgaris*. *Proteus vulgaris* produces phenylalanine deaminase. When ferric chloride is added to the medium it reacts with the phenylpyruvic acid reaction product, forming a green compound (Fig. 6-81, p. 74 of the Atlas). Since *E. coli* does not produce the enzyme, it cannot deaminate phenylalanine. Therefore when ferric chloride is added to an *E. coli* culture there is no color change.

Procedure:

Period 1

Using aseptic technique, inoculate each test organism into separate phenylalanine deaminase agar slants. Label each of the tubes clearly indicating the type of medium and the organism along with your group or table identification and date. Incubate the tubes at 35 °C for 20-24 hours.

Period 2

With a Pasteur pipette, add a few drops of the 10% $FeCl_3$ reagent. A yellowish green color that develops within 1 to 5 minutes is a positive test for the presence of phenylpyruvic acid indicating that the test organism has the phenylalanine deaminase enzyme. If there is no color change after adding the $FeCl_3$ reagent, the test is negative and no deamination has occurred.