

# Urease Testing

**Copyright © Texas Education Agency, 2014.** These Materials are copyrighted © and trademarked ™ as the property of the Texas Education Agency (TEA) and may not be reproduced without the express written permission of TEA, except under the following conditions:

- 1) Texas public school districts, charter schools, and Education Service Centers may reproduce and use copies of the Materials and Related Materials for the districts' and schools' educational use without obtaining permission from TEA.
- 2) Residents of the state of Texas may reproduce and use copies of the Materials and Related Materials for individual personal use only, without obtaining written permission of TEA.
- 3) Any portion reproduced must be reproduced in its entirety and remain unedited, unaltered and unchanged in any way.
- 4) No monetary charge can be made for the reproduced materials or any document containing them; however, a reasonable charge to cover only the cost of reproduction and distribution may be charged.

Private entities or persons located in Texas that are **not** Texas public school districts, Texas Education Service Centers, or Texas charter schools or any entity, whether public or private, educational or non-educational, located **outside the state of Texas** *MUST* obtain written approval from TEA and will be required to enter into a license agreement that may involve the payment of a licensing fee or a royalty.

For information contact: Office of Copyrights, Trademarks, License Agreements, and Royalties, Texas Education Agency, 1701 N. Congress Ave., Austin, TX 78701-1494; phone 512-463-7004; email: [copyrights@tea.state.tx.us](mailto:copyrights@tea.state.tx.us).

- The urease reaction is used to identify the rapid urease producers *Proteus* and *Morganella species*, as well as slower urease producers *Klebsiella* and some species of *Enterobacter*.

# The Urease Reaction

- Principle: Urease is an enzyme that splits urea into alkaline end products of ammonia, carbon dioxide, and water. The ammonia reacts in solution to form ammonium carbonate resulting in a lower pH of the broth. This causes the indicator to change from a buff color to pink-red (fuchsia).

# The Urease Reaction

- Purpose: identification of *Proteus*, *Morganella*, *Klebsiella*, and some species of *Enterobacter*.

# The Urease Reaction

- Procedure:
  - Place one single isolated colony into the urea broth with an inoculating loop. The colony should be 18 to 24 hours old.
  - Replace the cap loosely on the broth or use parafilm over the opening.
  - Incubate at 35C for 18 to 24 hours.
  - Tubes may be placed in the refrigerator after incubation until they can be interpreted by the student.
  - Record observations:
  - Positive: Pink-red color broth
  - Negative: Buff color broth

# Quality control

- Positive: *Proteus vulgaris*
- Negative: *Escherichia coli*