I. PURPOSE
To learn how to recognize physical and chemical changes in matter.

II. MATERIALS
1. disposable test tube
2. test tubes
3. Bunsen burner
4. utility clamp
5. glass slide
6. wood splint
7. test tube rack
8. NaCl (cr)
9. Cu(NO$_3$)$_2$ (cr)
10. 6M HNO$_3$
11. 6M HCl
12. 1M Na$_2$SO$_3$
13. 0.1M FeCl$_3$
14. 0.1M KSCN
15. 0.1M AgNO$_3$

III. PROCEDURES
Record observations before, during and after for each of the following procedures.

Part A
1. Break a wood splint into small pieces and place in a disposable test tube provided by your instructor. Heat the test tube for several minutes keeping the Bunsen burner moving with your hand. CAUTION: beware of hot glass and fumes from test tube. Dispose of the disposable test tube in the broken glass container.

Part B
1. Mix a few crystals (size of half a green pea) of NaCl with 2 or 3 mL of distilled water in an evaporating dish. Place a few drops of the solution on a glass slide and heat very gently over the Bunsen burner flame holding the glass slide with crucible tongs. After the liquid has evaporated and the slide has cooled, observe the substance on the slide. CAUTION: do not inhale the fumes.

Part C
1. Place a few crystals of Cu(NO$_3$)$_2$ (size of half a green pea) in a test tube. Heat the crystals slowly at first and then increase the heat until the reaction is complete (black). Let the test tube cool, then add 10 drops of 6M HNO$_3$. Heat gently but not to dryness and observe. CAUTION: do not inhale the fumes.

Part D
1. Obtain 3 clean test tubes and mix the following solutions:
   a. Mix vigorously 5 drops of FeCl$_3$ solution with 3 drops of KSCN solution.
   b. Mix vigorously 5 drops of FeCl$_3$ solution with 2 drops of AgNO$_3$ solution.
   Let stand in test tube rack at least 2 minutes. Record your observations.
   c. Mix vigorously 5 drops of Na$_2$SO$_3$ solution with 1 drop of 6M HCl.
   Check the test tube for odor. Record your observations.

IV. PRE-LAB QUESTIONS
1. What is the basic difference between chemical and physical changes?
2. What is the purpose of breaking the splint into small pieces in Part A?
3. What is the correct procedure for checking for odor in Part D?
4. What types of observations are made in this lab?

V. DATA & CALCULATIONS
A. DATA
   This should be a list of all observations made during the lab. Make subheadings for each part of the lab.

B. CALCULATIONS
   None

VI. QUESTIONS & DISCUSSION OF ERROR
A. QUESTIONS
1. List all of the physical changes observed in this lab.
2. List all of the chemical changes observed in this lab.
3. What kinds of observations indicate chemical change?
4. What kinds of observations indicate physical change?
Lab 03.2a
Physical and Chemical Changes

B. DISCUSSION OF ERROR

VII. CONCLUSION