Part 1. Multifiber Fabric

Exercises A, B, and D should be performed by each group separately. Exercise C should be performed as a class. Follow the laboratory safety steps your instructor will share with you. As you perform the tests, record your observations on the Data Chart on the back of this sheet.

Exercise A. Burn Test
1. Light a small candle and place it on a table in a safe place.
2. Use forceps to pull one thread of acetate fibers from the multifiber fabric.
3. Holding the thread with forceps, slowly move the end of the thread toward the flame from the side. Note the reaction of the fibers in the thread as they approach the flame (e.g., curl away from the flame or melt).
4. Move the end of the thread into the flame and pull it back out. Notice the way the fibers ignite and burn (e.g., quickly or slowly). Do the fibers continue burning when removed from the flame? If the burning fibers give off a noticeable odor, try to describe it. Allow the thread to burn itself out.
5. Several seconds after the flame has died out, examine any ash or residue left. Note the color and form of the residue. Press a fingertip on the cooled residue to see if it is hard or brittle.
6. Record your observations.
7. Repeat Steps 2–6 for threads of cotton, nylon 6.6, silk, viscose, and wool.

Exercise B. Solvent Test
1. Get 18 small test tubes and a test-tube rack.
2. Divide the test tubes into 3 sets of 6. Use a glass-marking pencil to number the tubes in one set "A1"—"A6." Number the tubes in the second set "H1"—"H6" and the third set "S1"—"S6."
3. Carefully add about 3 mL of acetone to each "A" tube. Add 3 mL of hydrochloric acid to each "H" tube and 3 mL of sodium hypochlorite solution to each "S" tube. Place the test tubes in the test-tube rack. (Be careful not to mix chemicals.)
4. Use forceps to pull a thread of acetate from the multifiber fabric.
5. Cut 3 pieces of the thread about 5 mm long with scissors. Discard the rest of the thread. Use forceps to drop a piece of thread into each of the #1 tubes. (A1, H1, and S1).
6. Repeat Steps 4 and 5 for the other fibers. Place the pieces of cotton in the #2 tubes, nylon 6.6 in #3 tubes, silk in #4 tubes, viscose in #5 tubes, and wool in #6 tubes.
7. Observe the test tubes for 10–15 minutes. Note whether any of the threads are dissolved or affected by the solvents. Record your observations.

Exercise C. Stain Test
1. Get a clean, labeled piece of multifiber fabric.
2. Using the dark line as a guide, write down the order of the fiber strips in the multifiber fabric.
3. Your instructor will prepare a boiling stain solution. Along with the other groups, place your piece of multifiber fabric in the boiling stain for five minutes.
4. Remove your piece of fabric from the stain and rinse it with hot (50°C) water.
5. Roll up your piece of fabric in several layers of paper towels and press it dry.
6. Examine the fabric when it is cool enough to handle. Note the color each fiber has been stained. Also note whether it is lustrous (shiny) or dull. Record your observations.

Exercise D. Microscopic Examination
1. Use the piece of multifiber fabric stained in Exercise C to make microscope slides of different fibers. The fabric must be completely dry. If necessary, place the fabric in an oven at 60°C for 5–10 minutes.
2. Use forceps to pull a thread of acetate from the fabric and unravel the thread.
3. Get a clean microscope slide and place a small drop of mountant on it.
4. Use forceps to tease a few fibers gently from the unraveled thread. Place the fibers on the drop of mountant. Discard the rest of the thread.
5. Get a clean coverslip and carefully lower it over the drop of mountant.
6. Label the slide "acetate."
7. Examine the slide under the low- and high-power objectives of a microscope. Examine the fibers closely, noting any distinctive features. Pay close attention to the presence of striations (longitudinal or cross markings), folds, or twists. Note whether the fibers are transparent or opaque. Record your observations.
8. Repeat Steps 2–7 for each of the other five types of fibers.

Part 2. Unknown Fabric

Remembering to follow laboratory safety guidelines, perform the burn test, solvent test, stain test, and the microscopic examination on the unknown fabric. Use thread, pieces, or fibers, as needed for each test. Record your observations in the Unknown column of your Data Chart.

Part 3. Identifying the Unknown

To identify the fiber in the unknown fabric, review the observations made for each test of both the multifiber and unknown fabrics. Prepare a chart that lists any similar features of the unknown and the knowns in terms of all the tests and observations you have performed (burn, solvent, stain, and microscopic examination). Examine the chart to see if any known fiber matches the unknown for all the tests. If just one fiber is a match, you can assume it is the same type of fiber as the unknown.

If you cannot identify the unknown, reexamine the microscope slides and stained pieces of fabric. Determine which known fibers are possible matches with the unknown. Repeat the burn and solvent tests for only these fibers and the unknown. Compare your observations from these tests to decide which type of fiber is most likely to be in the unknown.
## Student Data Chart
### Fiber Identification Kit 69-9875

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Acetate</th>
<th>Cotton</th>
<th>Nylon 6.6</th>
<th>Silk</th>
<th>Viscose</th>
<th>Wool</th>
<th>Unknown</th>
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</thead>
<tbody>
<tr>
<td>Exercise A: Burn Test: Approaching name&lt;br&gt;Burning reaction&lt;br&gt;Residue</td>
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<td>Exercise B: Solvent Test: Acetone&lt;br&gt;Hydrochloric acid&lt;br&gt;Sodium hypochlorite</td>
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<td>Exercise C: Stain Test: Color&lt;br&gt;Appearance</td>
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<td>Exercise D: Microscopic Examination: Markings&lt;br&gt;Folds or twists&lt;br&gt;Transparent or opaque</td>
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Name __________________________

Date __________________________