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Lab # 5 FIBER ANAYLSIS

Fibers, strands of thread that make up yarn, are all around us. You encounter a variety of fibers each day. Fibers make up thousands of products, including: **clothing, upholstery, carpet, rope,** and **building components.** As you interact, according to **Loccard's Exchange Principle,** you pick up some fibers directly or indirectly and carry these fibers else where as you go about your daily activities. Therefore, fiber evidence and analysis can often provide forensic investigators with valuable information about where people have been in the past.

PURPOSE: To differentiate between Natural fibers and Synthetic fibers. To determine the identity of an unknown crime scene fiber.

MATERIALS:

EQUIPMENT

CHEMICALS

PROCEDURE:

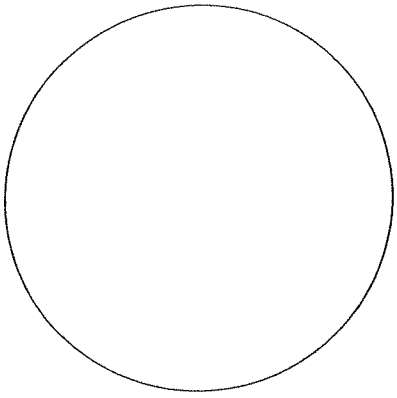
1. Obtain the following materials form your instructor.
   a. Microscope
   b. Microscope ruler
   c. Forceps
   d. Microscope slides
   e. Cover slips
   f. Beaker of distilled water
   g. 5 red fiber samples: Wool, Rayon, Silk, Polyester, and Cotton
   h. White paper
   i. Candle
   j. Match
   k. Glass square
2. Prepare and Label five Microscope slides with the fiber samples.
3. Observe the five prepared slides under low and high power. Draw and record all observations (be sure to be specific because you will be using these drawings and observations to identify your unknown sample).
4. Light your candle and compare the burning characteristics of the known samples. Record your information in the data table.
   a. Holding the fiber in the forceps, bring it close to the flame, **but do not touch the flame!** Describe the fiber's behavior as it approaches the flame: does it melt, ignite, curl-up.

   b. Holding the fiber in the forceps, touch the fiber to the flame. Describe the fiber's behavior: does it ignite quickly or slowly? Does it sputter,, drip, or melt?
   c. Remove the fiber from the flame and describe how it behaves. Does the fiber self extinguish, continue to burn, or continue to glow?
   d. Note any odor associated with the fiber in the flame. Does it smell like vinegar or hair?
   e. What kind of residue is left after the fiber is removed from the flame. Is it a white, fluffy ash, a hard head, or a melted blob?
5. After the five samples have been studied and identified return these samples to your instructor and sign out your unknown crime scene fiber (repeat any steps to make sure you have enough information to identify your unknown).
6. Repeat steps 2 – 4 and record your information in the data table.
7. Identify your unknown crime scene fiber.

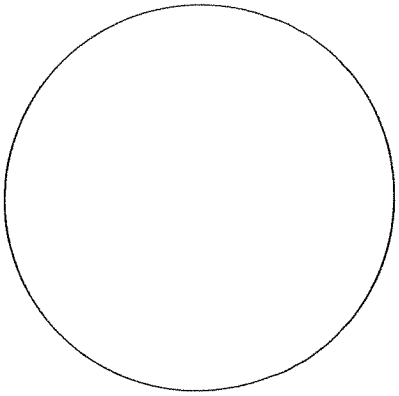
DATA AND OBSERAVTIONS

SAMPLE 1: _____

OBSERVATIONS



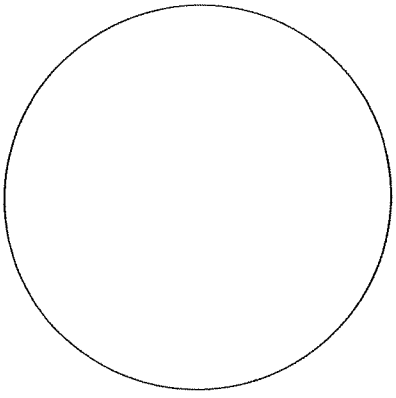
LOW POWER



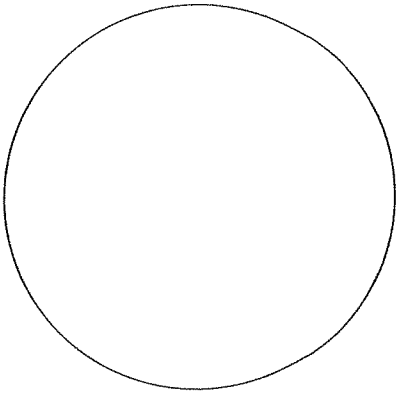
HIGH POWER

SAMPLE 2: _____

OBSERVATIONS



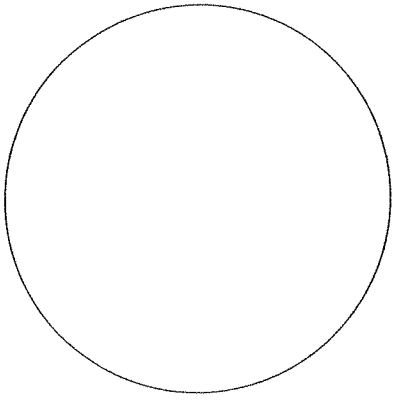
LOW POWER



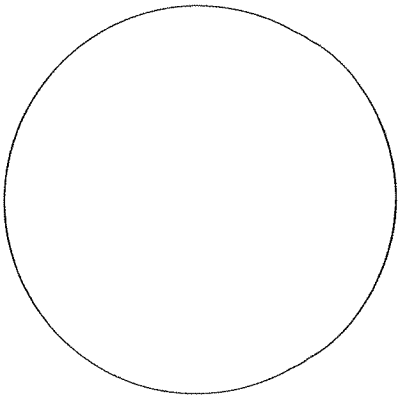
HIGH POWER

SAMPLE 3: _____

OBSERVATIONS

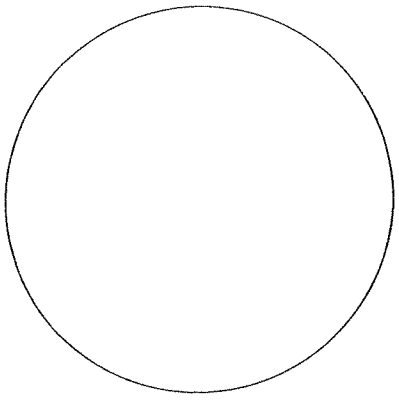


LOW POWER

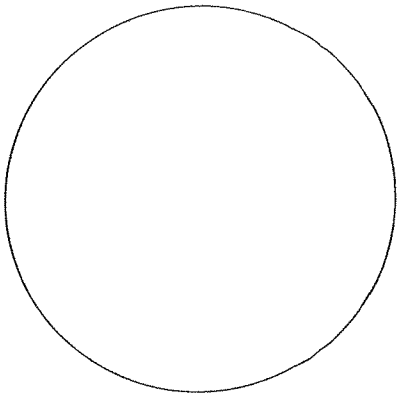


HIGH POWER

SAMPLE 4: _____



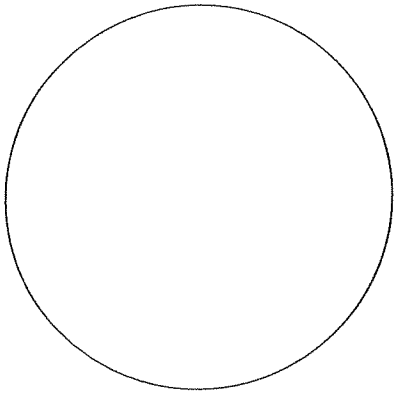
LOW POWER



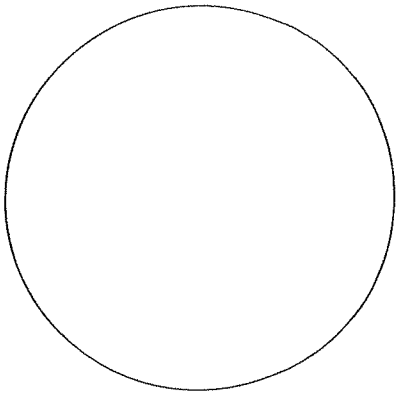
HIGH POWER

OBSERVATIONS

SAMPLE 5: _____



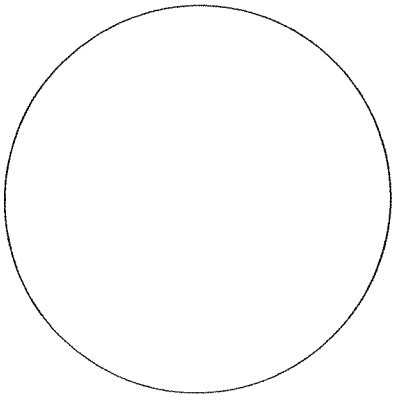
LOW POWER



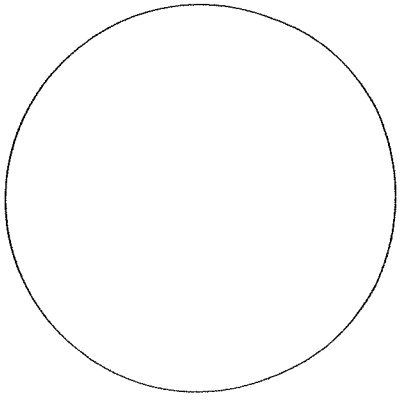
HIGH POWER

OBSERVATIONS

UNKNOWN: _____



LOW POWER



HIGH POWER

OBSERVATIONS

DATA TABLE

BEHAVIOR OF FIBERS IN FLAME

SAMPLES	APPROACHING THE FLAME	IN THE FLAME	REMOVED FROM THE FLAME	ODOR	RESIDUE
WOOL					
RAYON					
SILK					
POLYESTER					
COTTON					
UNKNOWN # _____					

OBSERVATIONS:

SUMMARY:

ADDITIONAL QUESTIONS

1. What are the major differences between natural fibers and synthetic fibers?

2. List three (3) examples of synthetic fibers and two (2) examples of natural fibers.

3. From your observations of the fibers under the microscope, which type of fiber is most like the unknown fiber taken from the victim at the crime scene? Describe the similarities of these two fibers.

4. Why might forensic investigators want to collect and identify unknown fibers at a crime scene?