Becoming A Fibre Detective

" a world of learning "

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Introduction

Discovering the identity of fibres in a fabric is exciting and fun, as well as providing valuable information that can be used to diagnose problems and improve designs. In this workshop, we will work on honing your investigative skills to help you become adept at fibre identification. You will use a systematic approach involving

- Initial observations
- Conducting a burn test
- Carrying out a microscopic examination
- Chemical analysis.

The final decision is based on the conclusions you draw as the investigation proceeds.

Initial Observations

This step helps rule out some fibre types. Start by examining the fabric closely and make notes on questions such as:

- How does the fabric look? Use as many descriptive terms as possible. For example – smooth, hairy, shiny, dull, crisp, limp, lumpy.
- What does the fabric feel like? Use terms such as warm, full, cold, slippery.
- Unravel a yarn and note if the fabric is composed of spun staple or continuous filament.
- How is the fabric constructed? For example, is it woven or knitted?
- Are all yarns in the fabric identical? In woven fabrics, the warp and weft yarns are often quite different.

Initial observations can help eliminate some possibilities. For example, if you find continuous filament yarns, you can rule out wool and cotton.

Burn Test

A simple burn test is a useful way to confirm your initial observations and to further narrow down the range of possibilities. By testing a small sample of the unknown fabric, you will gain information by watching

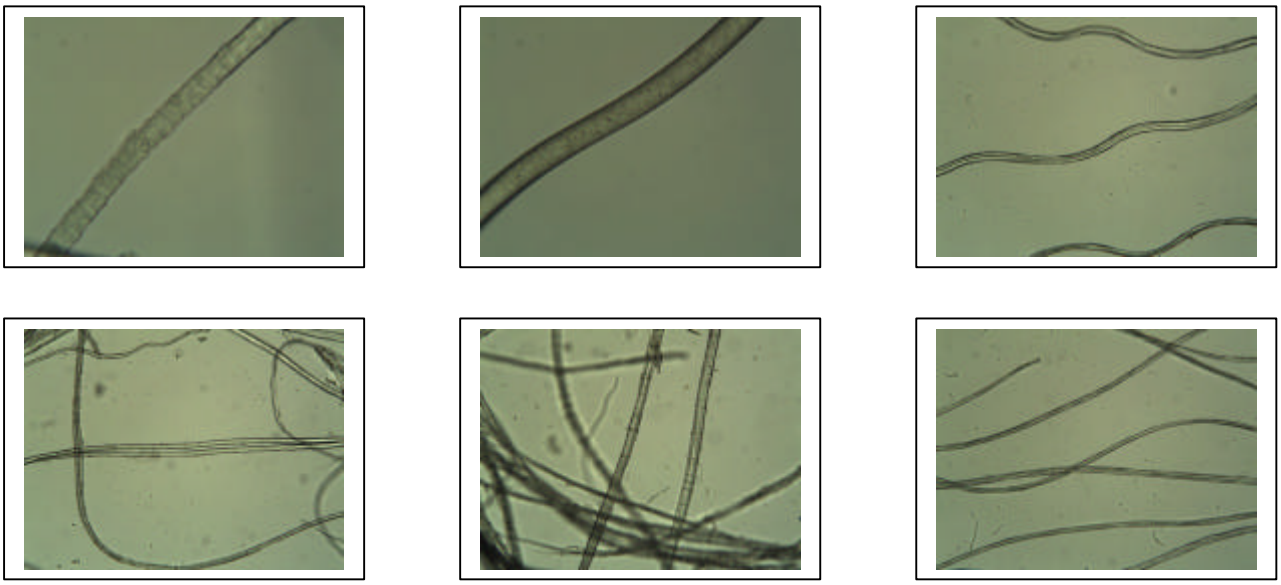
- how the fibres react as they approach the flame
- how they behave in the flame
- what happens as they leave the flame.

Your sense of smell is also important when conducting a burn test. Identify the smell by using comparison. For example, does the burning fabric remind you of the smell of burning paper, or perhaps hair?

Be aware that factors such as chemical finishes and fabric construction can influence the result. For example, flame retardant finishes will impede burning, and napped or brushed surfaces can enhance flammability. The potential for such factors to confound the result is why you should also carry out a microscopic examination before making a final identification.

Microscopic Examination

The microscope provides the means to examine the unique visual characteristics of fibres. Whether it is the scaly surface of wool fibres, the convoluted shape of cotton, or the smooth rod-like appearance of many synthetic fibres, ascertaining the appearance of an unknown fibre provides a key part of the identification process.



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Chemical Analysis

Chemical analysis is an advanced technique that requires specialised equipment and facilities. For the most part, advanced chemical analysis is used to discriminate between similar synthetic fibres. Given the nature of this work, most types of chemical analysis are not possible in school situations. However, Stain Testing is one type of chemical analysis that can be done with simple equipment. This type of testing uses commercially available dyes that vary in their affinity for particular fibres. By comparing the colour of the stained fabric to a reference standard, you can draw conclusions about the type of fibre in the fabric.

Summary

Identifying fibres need not be difficult when a systematic process is used to eliminate unlikely candidates and arrive at a feasible conclusion. The sequence is generally as follows:

- Make a comprehensive examination of the sample
- Remove any chemical finishes that might be present
- Extract yarns from fabrics
- Unravel yarns to fibres
- Observe fibre characteristics
- Conduct a burn test
- Make a microscopic examination
- Conduct a stain test if required
- Perform further chemical analysis if required.

Further Information

To learn more about our Fibre Identification Kits for Australian students, visit www.southernbiological.com or contact our office on (03) 9877-4597.

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