

The Color of Chemistry

Data Table

	Wool	Acrylic	Polyester	Nylon	Cotton	Acetate
Methyl Orange						
Malachite Green						
Crystal Violet						
Congo Red						
Alizarin						
Alizarin + Alum						
	Wool	Acrylic	Polyester	Nylon	Cotton	Acetate

Post-Lab Questions *(Use a separate sheet of paper to answer the following questions.)*

- Describe the colors produced by methyl orange on the different fabrics in the multifiber test fabric. Compare the results with the relative color intensities predicted in the *Pre-Lab Questions*. Explain any differences between the predicted and actual results.
- Compare the general ease of dyeing the six different fabrics in the multifiber test fabric. Which fabric(s) consistently developed the most intense colors, regardless of the type of dye used? Which fabric was the most difficult to dye?
- Consult Figure 1: What feature stands out as unique in the structure of the fabric that was the easiest to dye? What feature stands out as unique in the structure of the fabric that was hardest to dye?
- Consult Figure 2: Which two dyes have very similar structures? Compare the relative color intensities produced by these dyes on the different fabrics in the multifiber test fabric. Are the color patterns (from lightest to darkest) similar for these two dyes? Explain.
- Compare the color patterns produced on the different types of fabrics by methyl orange (a direct dye) and congo red (a substantive dye). Suggest a possible reason for any differences based on the chemical bonding interactions of direct versus substantive dyes (see the *Background* section).
- Show by means of a diagram one hydrogen bond that might form between a glucose unit in cotton and congo red.
Hint: Hydrogen bonds have the general form X–H --- :Y, where X and Y are highly electronegative atoms such as N, O, F, and Y has an unshared pair of electrons.
- Compare the colors produced by alizarin on the untreated and mordanted test strips. What is the principal advantage of using a mordant? What fabric was almost impossible to dye except with a mordant?