Greening up the blue dye in jeans, police uniforms and the red, white and blue

April 4 2012

Efforts are underway to develop a more environmentally friendly process for dyeing denim with indigo, the storied "king of dyes," used to the tune of 50,000 tons annually to color cotton blue jeans and hundreds of other products. That effort is the topic of an article in the current edition of *Chemical & Engineering News* (C&EN). C&EN is the weekly newsmagazine of the American Chemical Society (ACS), the world's largest scientific society.

In the article, C&EN Assistant Managing Editor Michael McCoy notes that concerns about the environmental effects of indigo represent a modern concern about an ancient product. Indigo produces a rainbow of hues, ranging from deep navy to pale pastels. For centuries, the primary source of indigo was branches of a bush native to India. In 1878, German chemist and Nobel laureate Adolf von Baeyer made the first synthetic indigo, but the process was too expensive. It took chemical manufacturer BASF years to find a practical process for making the dye, and that happened only because of a lucky accident in which a lab worker broke a mercury thermometer, and the mercury catalyzed a reaction to make the dye.

The story describes how a partnership between the dye manufacturer DyStar and Swiss startup RedElec Technologie may be the beginning of a new revolution in indigo dyeing that will improve its environmental profile. To get indigo dye to attach to denim and other fabrics requires chemical reactions before and after the dye impregnates the cotton fibers. Even with modern improvements to the technique, the process

produces large amounts of waste. The article highlights a new approach designed to achieve a long-standing goal of eliminating the need for sodium hydrosulfite in the dyeing process. Doing so would green up the indigo dyeing process and stop a water pollution problem at its source.

More information: Into the Blue - cen.acs.org/articles/90/i14/Blue.html

Provided by American Chemical Society