CHEMISTRY OF DYEING

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Introduction

In almost anything that human beings do, some form of chemistry is involved. Indeed, it can be argued that most of the things that human beings use are created from a chemical process. For instance, the clothes that people wear emanate from a chemical process specifically when it comes to the dying process since it is in this process that the colors and patterns of the fabrics that are used to make the clothes emanate from. On the other hand, the attractiveness of the textiles happens to be on the color of the textiles as well as the manner in which that color is used to create the different patterns that are on the textile. Indeed, in order for the textile to have the desired color, the textile has to be immersed in a solution containing the dye that has the desired color. This paper focuses on the topic of chemistry of dyes and discusses the topic from different perspective. Dyeing as has been used in this paper entails the procedure of adding color to the different textile products.

How dyeing occurs at the molecular level

As explained by Choudhury (2007), each individual fiber comprises of numerous individual long molecular chain of separate chemical structure. On the other hand, Aspand (1997) has explained that the arrangement as well as the orientation of the molecules on each fibre together with the shape of the fibre has an influence on the properties of the fibre. Nevertheless, it can be explained that the key physical and chemical elements mainly depend on chemical arrangement of the long molecular chains that make up the fibre.

On the other hand, the dye molecule can be expounded on as a multifaceted organic company that comprises of one chromophore and other auxophores that are crucial in the fixation in the textile fibres. In any given solution, it can either be on its own or be part of a group depending on the iconic nature as well the molecular weight of the dye (Choudhury, 2007).

During dyeing occurs at the molecular level, three main phases are involved. In the first phase, the dye molecules move from the dye bath to the surface if the fiber resulting to the adsorption of the surface of the fibre. In the second phase, the dye molecule is diffused from the surface to the inside matric of the fiber because of the concentration gradient of the dye molecule. Finally, in the third phase, the diffused dye molecules are bonded with the functional groups of fibre polymer through various chemical fixation succeeded orientation as well as aggregation (Aspand, 1997).

Why dyeing with and without a mordant produces a different color

Mordant can also be explained as a color fixative that is required prior to the dyeing process. By making use of the mordant, the color set into the fabric is made and in the process ensures that the dye cannot be wash out and as a result, dyeing with or without a mordant results to a different color. In most cases, the dyers mordant the cloth initially before they can then apply the dye in a different stage. Dyers will also ensure that the stages are different when different batches of color that have different shadings are required. In order to have various shades of color, the dyers apply a distinct mordant during each dye procedure. Some of the mordants that are common

includes; alum, baking soda, iron, vinegar, and cream of tartar (Bhattacharya and Shah, 2006).

Thus, it can be explained that mordants play a vital role since they are responsible for ensuring that different natural dyes that could have wash out do not wash out since the mordant stays in the fiber for a very long time. Nevertheless, it can be explained that the mordant can be applied before dyeing, during dyeing or after dyeing.

Why varying the acidity of the dye bath affects the final colour

As already pointed out when discussing about how dyeing occurs at the molecular level, fabrics contains molecule. In that view, it can be noted that once the molecules comes into contact with the dye bath, the final color of the fabric depends with the acidity level of the dye bath. Indeed, from a study that was carried out by Baig (2011), it was found that there is little color strength in a dye bath that has high acid levels. From that perspective, it can thus be explained that when the final color of a fabric that is undergoing the dying process is intended to be strong, then the person dying has to ensure that the dye bath gas low acidity levels. On the other hand, in case where the final color is desired to be faded, then the acidity level of the dye bath has to be very high.

References

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