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Investigation of Stabilization of Natural Dyes to Textile Dye Industry

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Abstract

The major problem regarding natural dyes was lack of availability of standard shade cards and reproducibility of shades; as a result the synthetic dyes have captured the market. Because clothing is in constant contact with our skin, the chemicals used in dyeing are absorbed into our skin through the pores and these create various skin diseases. The alternative to the problem is natural dyes which are more aesthetic and safe for dyers as well as wearers. The aim of this research is to investigate the suitability of natural dyes on a range of different fabric types and their storage stability for industrial purposes. An attempt has been made in laboratory scale and in pilot plant also using some selected flowers like Mari-gold for dyeing of textile fibre to get a clear idea of preparation of dye from these flowers & using it in Textile Industry and making the process economically viable. *Tegetus erecta* (marigold) belongs to family *Asteraceae*. It produces natural dye from its stem, which has been used for dyeing textiles. In this research innovative dyeing with *tegetus* was shown to give good dyeing results. Pretreatment with 1-2% metal mordant and by using 5% of plant extract (owf) was found to be optimum and showed very good fastness properties for cotton, wool and silk dyed fabrics. As the first step, a comprehensive analysis, which describes the nature of selected natural materials, was carried out in order to select the suitable mordant to obtain the required colour. An analysis was done on the dye extraction method. Secondly it's very vital to present detailed specification which contain the characteristics of the dye which will be indicative of the life time of a dye and colour fastness for washing and sunlight. This made easier to analyze the fabric requirements for the particular dye and justify the selections as well. The ultimate aim of this research is to come up with a technically viable solution to provide natural dyes with shelf stability to be used as textile dyes. In addition, it is proven that the method of freeze drying is capable of converting liquid dye extracts into soluble powder. According to the results it can be concluded that best method for the converting liquid dye solution to the powder form is by using rotary evaporator and freeze drying. And it is obvious that by converting a liquid in to powder form will increase the life time of the dye solution since in the powder form there is no water which is necessary for the living of fungus that makes the lesser life time. When observing the fastness properties all the fastness properties are within the acceptable range. Thus it can be concluded that the stability of the dye can be improved by converting liquid dye into powder form since dye powder is free from water.

Keywords: Synthetic dyes, Natural dyes, Stability, Colour fastness