



*Brief Note*

## TREATMENT OF WASTE WATER FOR RESIDUAL DYE REMOVAL IN SILK DYEING UNITS

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### ABSTRACT

The silk dyeing industry poses environmental hazards associated with residual dye discharged into the left over waste water. Hence, the effluent from the dyeing units deserves proper treatment before being discharged into the sewer to ensure biosafety of environment. The dyes used in the industry are usually dispersible, and the surplus or the residual dye is removed using various physiochemical, chemical, biological and electrochemical techniques. But, complete removal of the dye from the waste water still remains a difficult task. Many researchers have been working in the direction of more efficient and cost effective methods of dye removal. This study was undertaken with this backdrop wherein, an attempt was made adopting a new technology for dye removal from waste water discharged after dyeing of silk, using muffle furnace at high temperature of 800 °C with zero water discharge. The commercial dyes have revealed the presence of banned aryl amines when subjected to High Performance Liquid Chromatography (HPLC). Muffle furnace treatment of dye waste water at 800 °C for 3 minutes for branded dye (have known chemical groups/chemical abstract numbers and made by certified manufacturers) and at 800 °C for 9 minutes for commercial dye (dyes purchased from local market and difficult to identify composition of molecules) was found to be effective for colour disappearance and dye waste water evaporation. Thermogravimetry-differential scanning calorimetry (TG-DSC) and Gas chromatography-mass spectrometry (GC-MS) instrumental analyses were carried out to detect the components of the residue. Results showed that at 800 °C, it reduced to a higher extent with formation of many compounds evaporated in gaseous form such as 3-(2,2-dimethylpropylidene) bicyclo[3.3.1]nonane-2,4-dione, Butylated hydroxytoluene (BHT) *etc.*

**Key words:** Acid dye, dye waste water, GC-MS, silk, TG-DSC.