

Lab Summary

New Analytical Method for the Determination of Detergent Concentration in Water by Fabric Dyeing

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[Abstract]

The use of harmful organic solvents in classrooms has become a critical issue of concern in the field of chemistry education. This paper describes a classroom activity at a high school in which an acrylic fabric was used as the extraction medium in the analysis of the detergent concentration in water instead of organic solvents. Dyes were used to combine with the detergent in solutions of different concentration. The colored, dye-detergent compound produced was then extracted by adsorption onto fabric. Sodium dodecyl sulfate (SDS) was used as the detergent and a new inexpensive hand-made reflection photometer, assembled with inexpensive materials like LED, PVC tube and CdS sensor, was used to determine the color depth of the dyed fabric. The calibration curves of color depth versus the SDS concentration can be used to determine the unknown concentration of the SDS solution. The experimental results indicate that this harmless and environmentally friendly analytical method for determining detergent concentration can be safely introduced into schools.

[Key words]:

Detergent, dye, fabric, hand-made reflection photometer, color depth.