

Design and Fabrication of a Local Colorimeter for the Developing Countries

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A colorimeter is a device which magnifies the quality of color perception to the human eye. It uses the light sensitive gadgets to determine the concentration of a solution in industries, hospitals and laboratories. This device can be used to measure, monitor or maintain the accuracy or purity of solutions like water and body fluid samples. Based on the Beer-Lambert law, it measures the absorbance of particular spectrum of white light or wavelength in a specific solution to determine the concentration of solutes dissolved in it. From the aperture the light beam is transmitted to the transparent cuvettes that holds the test or control solution. Certain components of the light beam are absorbed while some are transmitted depending on the concentration of the solution. The portion of the light transmitted from the cuvette falls on the photocell containing photoelectrical resistive material that converts the photo energy to electrical signal. The small signal (within the range of milli-ampere and picoampere) is amplified with transistors and measured by an analogue meter as transmittance. This device is locally designed with safety considerations. Further work can connect this colorimeter to a digital display meter or sent to a chart recorder, data logger or computer depending on the need of the operator.

Key words: Colorimeter, Design, color, concentration