

My medicine cabinet is a virtual rainbow of colors left over from my desperate battle with the flu last winter. There's the green of nighttime cold medicine and red for the daytime version. There's a purple one I tried when the red one didn't work and a clear one I tried when my flu proved too powerful for the purple. Next to those are packets of glowing liquid capsules, purchased by my husband when, in my fevered state, I could not remember the name of the medication I wanted and told him to "just get the orange ones."

The Significance of Color

The color of liquid pharmaceuticals can be vital to their use, acting as an identifying marker, enhancing user perception, and allowing for appropriate medication administration. Some medications are pigmented according to potency or suggested use, allowing easy visual distinction between formulations and subliminally affecting patient expectations. As Color Matters points out, "Patients respond best when color corresponds with the intended results of the medication. For example, calm blue for a good night's sleep and dynamic red for speedy relief."¹ Color can be used to correspond with the flavor additives designed to enhance palatability and appeal, particularly in medications designed for children.² Other liquid pharmaceuticals depend on clarity and the absence of colorants to allow them to be mixed into edibles or beverages without altering the appearance of the food or drink or to indicate purity of injectables. The significant utilitarian and [psychological role of color in medications](#) demands sophisticated monitoring to ensure consistent and accurate batch-to-batch coloration and formulation. Spectrophotometry offers an ideal, easy-to-use solution to the challenges of color measurement in liquid pharmaceuticals, safety, patient persistence, and marketability.

Spectrophotometric Options for Measuring Color in Liquid Medication

The spectrophotometric instrumentation and color measuring process chosen for liquid pharmaceuticals depends on the unique formulation of each drug. The versatile nature of spectrophotometers ensures accurate color measurement using sophisticated geometries targeted to the optical qualities of the liquid.

Opaque Liquids: Directional 45°/0° reflectance instrumentation is ideal for measuring color in liquid pharmaceuticals that are impenetrable by light. This system accounts for both color and surface changes and is designed to mimic the way the human eye perceives chromatic information. However, the objective nature of reflectance spectrophotometers removes [the subjectivity of human perception to provide precise, quantifiable spectral analysis](#).

Translucent Liquids: Translucent liquids are very popular choices for pharmaceutical formulations and present special challenges for color measurement, making it difficult to accurately capture chromatic information without the advanced capabilities of spectrophotometry. Because translucent liquids both reflect and transmit light simultaneously, the specific visual qualities of the medication will dictate the best analytical method. Most clear liquids often require transmittance measurement while liquids with higher opacity can be measured using either directional 45°/0° reflectance or diffuse d/8° sphere geometry.

Transparent Liquids: Transparency is critical to the appeal and usability of many liquid medications and accurate measurement of clarity ensures that consumer expectations are met. Transmission instrumentation is the perfect solution for measuring transparent liquids. Standardized quantification of the water whiteness of clear liquids using the [APHA/Pt-Co/Hazen Color method](#) can be used to identify yellowness that interferes with clarity, help identify degraded or contaminated medications, and facilitate the development of more stable liquid formulations.

Full article with photos available here:

<https://www.hunterlab.com/blog/color-pharmaceuticals/a-dose-of-color-using-spectrophotometry-for-color-measurement-in-liquid-pharmaceuticals/>