cphnano

Glycerol concentration, QC and NanoCuvette™ One

Quality control of glycerol in a solution can be done fast and easy with the novel NanoCuvette™ One.

1. Glycerol

Glycerol is a colorless, odorless, non-toxic, viscous and sweet-tasting liquid. It is used in a large variety of applications including as an emollient, humectant, sweetener, solvent, or antifreeze agent. Glycerol belongs to the alcohol family of organic compounds and contains three hydroxyl groups (-OH), which makes it soluble in water. It can be derived naturally and is stable under normal storage conditions and temperatures.

2. Quality control

For various applications of glycerol in the pharmaceutical, food, cosmetic, automotive and chemical industries, it is important to determine the concentration exactly to ensure proper quality of the products. Since glycerol does not absorb light within the visual range, a standard absorbance measurement using a spectrophotometer will not be effective at determining the glycerol concentration. Therefore, the glycerol concentration is determined by measuring the refractive index and holding it against a standard curve.

3. Principle

Traditionally, a specialized refractometer is required for the determination of the glycerol concentration. However, the innovative NanoCuvette™ One has a build-in optical filter which allows for determination of refractive index using a conventional spectrophotometer (Figure 1). Thereby, glycerol concentrations can easily be measured with a spectrophotometer.

4. Safety precautions

This method does not entail any safety precautions. Please refer to common laboratory practices.

5. Measurement

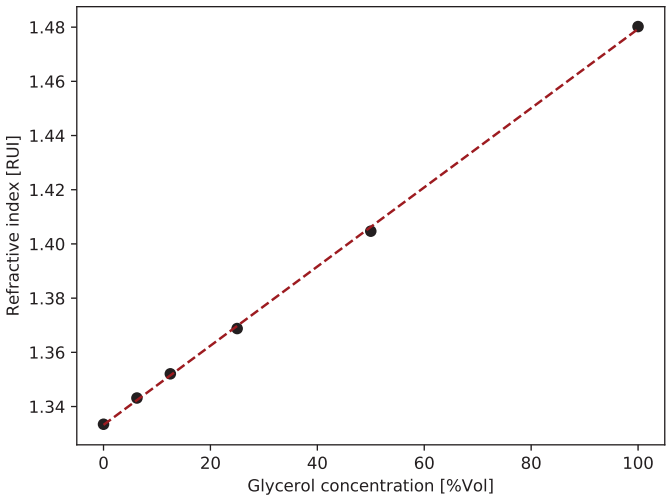

Figure 1: Refractive index of glycerol is linearly proportional to the glycerol concentration, which the software will display.

5A. Materials and apparatus

The only apparatus required is a conventional spectrophotometer and a computer with internet access. For each measurement a NanoCuvette™ One is required.

5B. Sample preparation

Glycerol is diluted in deionized (DI) water at volume concentrations from 0% to 100%.

5C. Measurement procedure

The spectrophotometer and computer are switched on and the online NanoCuvette™ software is opened in a web browser. For each sample, a new NanoCuvette™ One (Figure 2) is used according to the software guidance. The software presents the refractive index as a variable of glycerol concentration, depending on the experimenter's preferred choice of representation.

Figure 2: NanoCuvette™ One measures refractive index and absorbance for the same sample, using only a conventional spectrophotometer and the online NanoCuvette™ software.

6. Contact

Copenhagen Nanosystems ApS
Diplomvej 381
DK-2800 Kgs. Lyngby
Denmark

Tel: +45 36 99 27 46
info@cphnano.com
www.nanocuvette.com

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