

Apple juice, QC and NanoCuvette™ One

Refractometry is widely used in the quality control of juice and other beverages.



1. Apple juice

Apple juice is one of the most common fruit juices in the world. It is produced by the pressing of apples. This juice can then be further processed by enzymatic treatment, filtering, pasteurization and/or dehydration to produce a concentrate. Additionally various supplements such as vitamin C and other preservatives may be added.

2. Quality control

Proper quality control of juice and beverages is of major importance, both in terms of consumer experience and safety. A large variety of different components and factors can be analysed. These include, but are not limited to, salt, sugar, acidity, colour, flavour, odour, enzymes, total solids and contaminations. Some of these, like correct colour, can be measured on a standard spectrophotometer. Others, like salt and sugar, do not absorb light in the UV-visible spectrum, but can be measured using refractometry. Refractometry has the advantage of measuring the total of everything in the sample, i.e. if anything is off, it will let you know.

3. Principle

Traditionally, a specialized refractometer has been required for determination of the refractive index. However, with the innovative NanoCuvette™ One, a nanosensor is installed in a cuvette, allowing determination of the refractive index to be carried out in a standard spectrophotometer. This way even compounds that do not absorb light in the UV-visible spectrum can be measured with a conventional spectrophotometer.

4. Safety precautions

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

5. Measurement

5A. Materials and apparatus

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

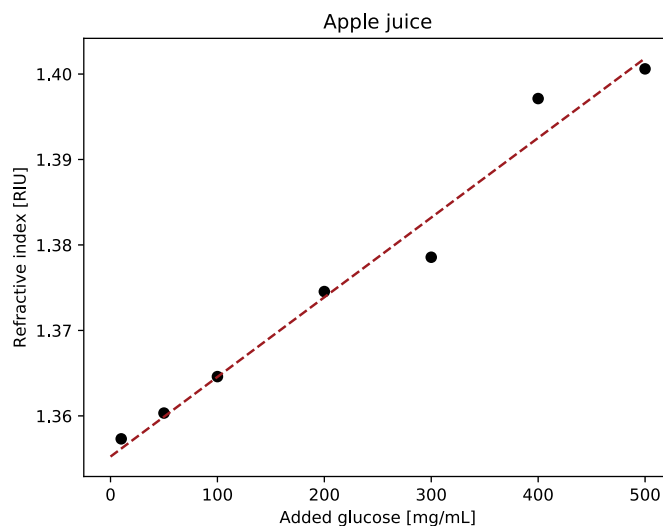


Figure 1 The sensor response, shown as refractive index, is dependent on glucose concentration, which the free software will display.

5B. Sample preparation

1 to 500 mg/mL sugar is added to your preferred apple juice.

5C. Measurement procedure

The spectrophotometer and computer are switched on and the free NanoCuvette™ One software is opened. For each sample a new NanoCuvette™ One is used according to the software guidance. Following the last measurement the software will present the data as a variable of absorbance or refractive index, depending on the experimenter's preferred choice of representation.

6. Contact

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Figure 2 NanoCuvette™ One measures refractive index and absorbance on the same sample, using only a standard spectrophotometer and the free NanoCuvette™ One software.