

Automated Liquid Handlers for Flavor Sample Compounding

By Helen Curtiss, Pepsi-Cola, Valhalla, New York

The compounding of flavor samples is a very tedious and labor-intensive operation for any laboratory. Formulating single-flavor formulas for initial screening is bad enough. However, when optimizing a formula that requires many formulas with only minor variations in just one or two ingredients, the work becomes so tedious that the rate of error rises and the quality of evaluation suffers because of concern for the accuracy of the sample preparation.

We have found that the use of an automatic flavor sample processor has been of great benefit to our laboratory in speeding the creating of flavor samples, and providing more accurate measurements. Flavorists are able to spend more time in creative work, and at the same time do a better job of optimizing flavors through the use of a wider range of alternate formulas for evaluation.

One such processor^a (Figure 1) utilizes a pipettor that, with a single piston, provides a range of about 250 to 1 in the amount that it can pick up and deposit. The 0.5 ml piston delivers a range from 0.002 ml to 0.5 ml. The tray contains five racks of tubes or bottles. Racks of 3.5 ml tubes have a maximum capacity of 6 rows of 18 in each row or 108 per rack. Thus a total of 540 tubes can be used at one time. For normal work, four trays of 108 giving 432 ingredients will be available to formulate into one tray of 108 small tubes, or a smaller number of larger bottles.

The pipet is driven by a piston which draws material from a supply bottle and delivers the required quantity to one of

the flavor bottles. The pipet needle is given an inside and outside rinse before accessing the next material. As the pipet enters and leaves each container it passes through a filter paper which wipes the outside of the needle and thereby reduces the unintended transfer of material from one container to another.

The unit is operated through a microcomputer (PC) with software that is completely programmable. A variety of formulas, along with almost infinite variations, can be entered and the unit will then proceed through the programmed series of formulas.

An earlier article described the use of a computer program to optimize the search for the best flavor for a particular purpose.¹ The automatic flavor sample processor is an ideal way to handle the type of variations in the basic formula required for this optimization process. This equipment is particularly well suited to follow a program of variations of a single formula.

Evaluation of cross contamination of the supply bottles has shown that there is no discernable unintended material transfer during the formulation procedure. This automatic flavor sample processor has proved to be a very useful addition to our laboratory.

Acknowledgement: Special thanks go to Tony D'Onofrio, director, Worldwide Technology—Product and Process Design, for his guidance and support.

References

Address correspondence to Helen Curtiss, Pepsi-Cola R&D Technical Service Center, 100 Stevens Avenue, Valhalla NY 10595 USA.

1. H. Curtiss, An application of computers to the flavor development process, *Perf & Flav* 17(2) 23 (1992)



^aGilson 222 XL, Liquid Handler, Gilson Medical Electronics, Box 620027, Middleton, Wisconsin. Fax 608-831-4451