

## Laboratory Report

# A Flask for Preparation of Standards in Gas Chromatography

Michael L. Nahrwold, M.D.\*

An inexpensive modification to the stopcock of a conventional gas-sampling bulb permits convenient preparation of standards for gas chromatography. (Key words: Measurement techniques, gas chromatography.)

MANY INVESTIGATORS prefer to prepare standards for gas chromatography by injecting a measured volume of liquid anesthetic into a glass flask of known volume. This operation is simplified when a rubber septum for injection of the liquid anesthetic is available. Unfortunately, very few gas-sampling bulbs available commercially are provided with a replaceable septum.

I have modified the Teflon stopcock of a standard gas-sampling bulb (#G2035-500, Scientific Products, 1430 Waukegan Rd., McCaw Park, Ill. 60085) to accept a septum that may be readily replaced (fig. 1). The original hole in the stopcock is bored out to about three fourths of its depth and tapped to a 7/16-20 thread. A 9-mm septum (#180-123, Gow-Mac Instrument Co., 100 Kings Rd., Madison, N.J. 07940) is placed into the hole and held in place by a short, alloy steel, hollow lock Allen screw (part #91302D686, McMaster-Carr Supply Company, P.O. Box 4355, Chicago, Ill. 60680). This screw is unique in that the hex socket extends the entire length of the screw to form a hole to permit access to the septum. A V-groove is cut into the side of the stopcock between the handle of the stopcock and the

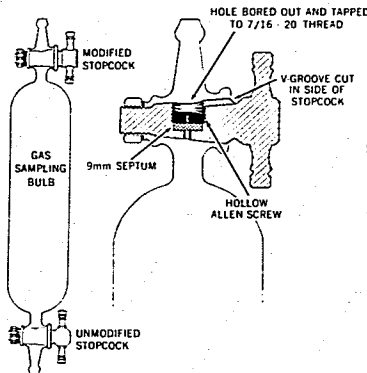


FIG. 1. Details of modification to the stopcock of the gas-sampling bulb.

bored-out hole. When the modified stopcock is turned so that the V-groove is facing the gas sampling bulb (180 degrees opposite the position shown in fig. 1), the V-groove forms a channel between the inside of the bulb and atmosphere.

To prepare a chromatographic standard, the modified stopcock is turned 180 degrees opposite the position shown in fig. 1. The other end of the bulb is connected to vacuum and the unmodified stopcock opened. A continuous flow of air enters the bulb via the V-groove to flush out the contents of the bulb. The modified stopcock is then turned 180 degrees to the position shown in fig. 1 with vacuum still applied to allow partial evacuation of the bulb. After a

\*Assistant Professor and Research Director, Department of Anesthesia, Milton S. Hershey Medical Center, The Pennsylvania State University, Hershey, Pennsylvania 17033.

Accepted for publication April 19, 1976.

Address reprint requests to Dr. Nahrwold.

few seconds, the unmodified stopcock is turned 90 degrees to close off the opening, and liquid anesthetic is delivered via a microliter syringe through the septum into the bulb. Next, the unmodified stopcock is opened to allow the contents of the bulb to equilibrate with atmospheric pressure. When the inrush of air has ceased, the stopcock is immediately closed and the contents of the bulb agitated. A small piece of aluminum foil inside the bulb aids this process. Ten- to 15-ml amounts of standard can then be removed from the bulb via the

septum using a syringe fitted with a 3-in-25-ga. spinal needle. At least three samples may be removed from a bulb of 500-ml volume before the partial vacuum inside the bulb begins to cause problems.

The above-described modification costs less than a dollar and is adaptable to a vessel of any size or shape so long as it is equipped with two Teflon stopcocks.

The author thanks Mrs. Sandra Good for preparing the illustration.

## Dental Anesthesia

**ANESTHESIA AND DENTAL EXTRACTION** In the United Kingdom, two million general anesthetic and sixty million local analgesic administrations are used annually for dental extraction. Both techniques were evaluated in one institution in order to determine whether there was any significant difference in morbidity. General anesthesia was administered to 300 patients, 277 of whom returned a questionnaire. Local analgesia was used in 218 patients, 159 of whom replied. General anesthesia consisted of  $N_2O-O_2$ -halothane with or without intravenous barbiturate induction. Local analgesia was accomplished by the injection of no more than 6 ml 2 per cent lidocaine with 1:80,000 epinephrine. General anesthesia lasted less than 5 minutes in 65 per cent of the cases and more than 10 minutes in only 3 per cent. Of patients receiving general anesthesia, 54 per cent were fit to leave the hospital 30 minutes after termination of the procedure. Almost 90 per cent had left after 45 minutes. Twelve patients receiving local analgesia fainted immediately after the injection. In patients receiving general anesthesia, 11 per cent did not require an escort. On the other hand, 30 per cent of the patients

receiving local analgesia desired such an escort. In both groups, approximately 35 per cent required postoperative analgesics. On the day of operation 50 per cent of the local anesthetic group and 15 per cent of the general anesthetic group found it difficult to open their mouths. Two patients receiving local analgesia developed severe trismus. By the following day, there was a 15 per cent incidence of difficulty in both groups. On the day of operation, 70 per cent of patients receiving local analgesia and 15 per cent receiving general anesthesia had difficulty in eating. By the next day the incidence had decreased to 10 per cent in both groups. On the trip home, 37 per cent of patients receiving general anesthesia and 10 per cent of those receiving local analgesia vomited. In the general anesthesia group, the incidence of vomiting could be related to duration of anesthesia. The following day, 28 per cent of patients given general anesthesia and 65 per cent of those receiving local analgesia felt unfit for work or school. (Muir VMJ, Leonard M, Haddaway E: *Morbidity following dental extraction: A comparative survey of local analgesia and general anaesthesia. Anaesthesia* 31:171-180, 1976.)