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Publisher *Taylor & Francis*

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Organic Preparations and Procedures International

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t902189982>

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To cite this Article Eaton, Jefferson T. and Gribble, Gordon W.(1974) 'SIMPLE RE-USABLE “AMPULES” FOR MICRO-REACTIONS', *Organic Preparations and Procedures International*, 6: 1, 45 – 47

To link to this Article: DOI: 10.1080/00304947409355070

URL: <http://dx.doi.org/10.1080/00304947409355070>

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SIMPLE RE-USABLE "AMPULES" FOR MICRO-REACTIONS

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We wish to report that the commercially-available, heavy-walled "Reacti-vials"³ or "Microflex Tubes"⁴ can easily be modified for use as total-immersion micro-reaction "ampules" ranging in capacity from 0.3 ml to 5.0 ml.⁵

Modifications of the smallest of these involve: (1) wrapping the threads of the glass "bottle" with three layers of teflon tape, (2) inserting a 1/16" x 7/16" teflon washer into the standard plastic screw cap from a common one dram sample vial⁶ and (3) firmly seating this assembly, hand-tight. (See Fig. 1). Such an "ampule" may be immersed in oil at 200° for a week or more without deterioration, leakage or failure. It is too heavy to float.

Slightly less convenient are modifications for the 5.0 ml container. A "plug," the dimensions of which are shown in Fig. 2, may be fashioned from a teflon rod. Within the

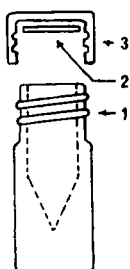


FIG. 1

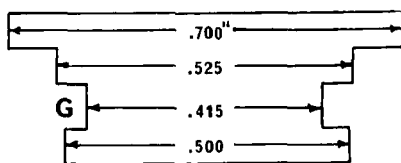


FIG. 2

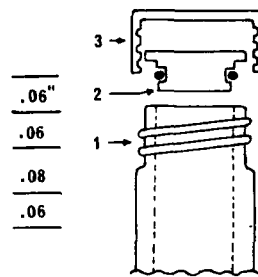


FIG. 3

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0.415" groove "G" is placed a standard "O" ring, size "-013".⁷ As before, (1) the threads of the glass bottle are wrapped with several layers of teflon tape, (2) the plug (with "O" ring) is fitted to the bottle⁶ and (3) a common plastic screw cap (from any appropriate standard sample vial) is seated firmly.⁸ (See Fig. 3).

The containers, as modified, are particularly suitable for reactions involving sublimable materials. In the course of 250 reactions using the 0.3 ml "ampule", we have not had an explosion or cap failure, even though we sometimes have heated liquid reagents slightly above their boiling points. CAUTION: The cap assembly for the 5.0 ml container is not as strong; reactions involving gaseous products or reagents with low boiling points should be attempted behind a safety shield.

By simply unscrewing the cap assembly from time to time aliquots can conveniently be removed during the course of a reaction--a clear advantage over sealed pyrex ampules.

Our modifications provide a safer, more flexible micro-reaction container than either capped culture tubes (explosion hazard)⁹ or ordinary standard sample vials (only partial immersion).¹⁰

Acknowledgement: We are grateful to the National Science Foundation (GP-13374), Eli Lilly, Merck Sharp and Dohme, and the National Institutes of Health (CA-14237) for their generous financial support of our research program.

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1. National Defense Education Act Predoctoral Fellow, 1968-1970.
2. Recipient of a Public Health Service Research Career Development Award (1 KO4-GM 23756) from the National Institutes of General Medical Sciences.
3. Pierce Chemical Company, Rockford, Illinois, 61105.
4. Kontes Glass Company, Vineland, New Jersey, 08360.
5. The "Reacti-vials" or "microflex Tubes" consist of a plastic septum cap, a teflon-faced rubber disc, and a "bottle"--the last of which may be purchased separately. In general, the commercial assembly is not satisfactory for immersion purposes.
6. The usual paper or cork liner should be removed first.
7. This is the "uniform dash number." The choice of "O" ring (i.e., base polymer from which it is manufactured) depends upon its compatibility with the chemical system to be contained.
8. The glass, plastic and teflon items are re-usable; the "O" ring may or may not be, depending on the chemicals contained.
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(Received October 29, 1973; in revised form January 14, 1974)