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SIMPLE PUSH-PULL GLASS VALVES

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Note for The Journal of Chemical Education

SIMPLE PUSH-PULL GLASS VALVES ¹

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We have developed several convenient push-pull glass valves for use in our work with circulating gas streams. The valves can be used in place of rotary glass stopcocks for controlling the direction of fluid flow. They are low in cost relative to metal push-pull valves and rotary glass stopcocks (particularly those of large bore size). Additional advantages of the new valves include: an absence of ground glass surfaces, little exposure to grease, ease of fabrication by a glass blower, and provision for rapid switching without the necessity for careful visual alignment of tube openings.

Each valve consists of a cylindrical barrel with attached ports, and a grooved sliding glass rod of smaller diameter. The rod is fitted with O-rings (lightly greased) in each groove. O-rings provide a seal between the rod and the barrel and direct fluid flow from and to the barrel ports. The rod is moved into either of two positions in order to change the direction of the flow. The accompanying photographs illustrate several valves including one of four-way construction. An on-off valve is shown disassembled. The handle and outer O-ring provide two physical stops which orient the rod relative to the barrel. The valves have been found to be vacuum tight (10^{-6} mm Hg), and to offer negligible resistance to gas flow. Additional details of construction are available from the authors.

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Fig. 1

Fig. 2

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