A simple device for washing out radioimmunoassay tubes

K. N. FRAYN *From the Experimental Pathology of Trauma Section, MRC Toxicology Unit, Medical Research Council Laboratories, Carshalton, Surrey*

The use of disposable polystyrene tubes for radioimmunoassay is now widespread. Washing out such tubes before disposal is tedious and time-consuming, especially if they contain dense charcoal or double-antibody pellets. In this laboratory the simple device described below has much reduced the time and tedium involved in this task. It was constructed in a few minutes for a cost of a few pence.

A hypodermic needle (19 g × 2 inches) is fixed to a length of plastic or rubber tubing (about 5 mm outside diameter, 4 mm bore) either by tying or simply by threading as shown in the figure. The plastic tube is connected to a pump which preferably discharges directly into a sink outlet or overflow. The needle is connected to a tap. Part of a disposable 1 ml-syringe makes a convenient adaptor. The apparatus is fixed in a clamp at a comfortable working height above a sink. For use water is passed through the needle (about 100-120 ml/min) and the pump turned on. Tubes to be washed are uncapped, held as shown over the apparatus for a few seconds, and discarded, conveniently into a plastic disposal bag fixed to the edge of the sink or bench. Obstinate pellets are rapidly dislodged and sucked away by turning the tube round to break them up with the point of the needle.

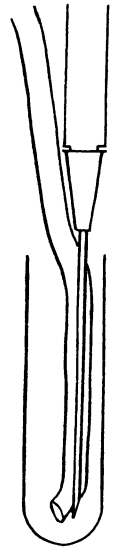

Fig *Tube-washing device with tube in position. For details see text.*

Typically about 10 tubes are washed per minute. At this rate activity is reduced from 5000 counts/min to 40 counts/min above background (about 3×10^{5} μCi per tube) even in tubes with dense charcoal pellets. (These are tubes used in an insulin assay with 50 pg/tube ^{125}I-labelled insulin). More than 60000 tubes could thus be discarded per day before exceeding the current disposal limit in this laboratory for solid waste of 2 μCi per day per room.

Received for publication 9 October 1974

Letters to the Editor

Concentration of Protein Solutions

When aqueous solutions of electrolytes are cooled, ice crystals are formed which are fundamentally the same as those formed in pure water; as freezing proceeds solute concentration occurs in the interstices and, theoretically at least, can eventually achieve a complete separation of vitreous water and dehydrated solute.[1]

Since dehydration by freeze-drying has often been used as a means of concentrating protein solutions, for example in csf and urine, but is time consuming and tends to cause denaturation, the possibility was considered of partial freezing, at a temperature high enough to minimize denaturation effects but low enough to separate water as ice and thus effect a solute concentration.

The temperature chosen was above the eutectic temperature of sodium chloride (−21°C) at which temperature the denaturation of β-lipoprotein in a rising electrolyte concentration rises sharply. Since the average deep freeze runs at a temperature of −17°C to −20°C the following technique was carried out using a domestic deep freeze operated at a temperature of −18°C.

Two millilitres of the fluid to be concentrated is placed in a plastics tube (polystyrene, 12 mm diameter) in a rack in the deep freeze. When completely frozen (one to two hours) the tube is held firmly in the horizontal plane and the first melted drop of fluid is captured in a drawn-out glass capillary. It is important not to permit the melting of more than about 20 µl of the frozen contents. The capillary is then used to apply the concentrated protein solution to the electrophoretic strip and, if required, the remainder of the capillary sample can be used in a micro-assay for total protein. For freezing the tube is held vertically in a metal rack ensuring one free space on each side of the tube. In the thawing technique the tube is

A simple device for washing out radioimmunoassay tubes.

K N Frayn

*J Clin Pathol*1975 28: 82
doi: 10.1136/jcp.28.1.82-a

Notes