CHAPTER 18

PREPARATION OF GLASSWARE

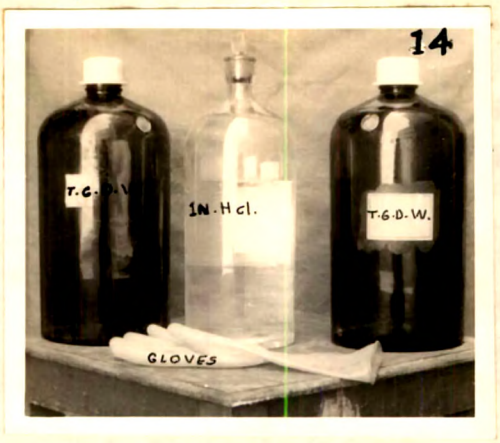
A special set of glassware must be kept separate for serum iron estimation. The glassware required for serum iron estimation includes, plain bulbs, all-glass syringes, test tubes, centrifuge tubes, pipettes, glass rods, funnels, beakers, flasks, reagent bottles, cuvettes etc. All these articles used either for collection of blood, storage of blood, separation of serum or estimation of iron must be rendered iron-free before they are taken for use.

REQUIREMENTS

(1) 1 N Hydrochloric acid solution

(2) Triple-glass-distilled water

(3) Gloves



Main requirements for preparation of glassware

1 N Hydrochloric acid used for rendering the glassware iron-free was prepared approximately and not accurately, as that much accuracy about the exact strength of hydrochoric acid required for the purpose was not indicated. The approximate 1 N HCl was prepared by diluting 80 to 90 ml. of concentrated HCl (A.R.) to 1 litre with triple-glass-distilled water.

Use of gloves was introduced after a serious thought to prevent the untolerable burning of skin of hands due to the action of acid, during the prolonged procedure of preparation of glassware.

PROCEDURE

(1) Immersion in Soap Solution :

The procedure was begun with immersion of glassware in

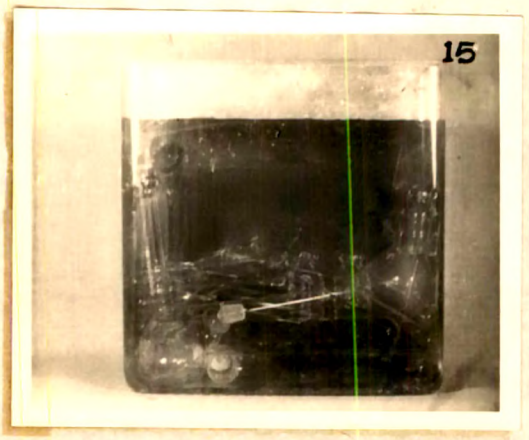
soap solution for preliminary cleansing. Use of soap solution and suitable brush used to remove the dust, blood clots, protein precipitates etc. from the previously used articles. Then the articles were washed with running tap water to remove the soap completely. This was followed by rinsing with triple-glass-distilled water and then immersion in a jar of 1 N HCl.

(2) Immersion in 1 N HCl:

A big glass jar was selected for this purpose. The jar itself was first rendered iron-free. For this purpose, the jar was completely filled with 1 N HCl and was allowed to stand for 48 hours (2 days) after covering with a glass lid. After this period, the HCl was thrown out and the jar was thoroughly rinsed with fresh 1 N HCl.

Then the jar was filled about half of its capacity with 1 N HCl. All the glass articles (except pipettes) were immersed in HCl, in such a way that each article was completely filled with the HCl of the jar. Small test tubes were arranged vertically in a beaker of 500 ml. capacity and the beaker was placed inside the jar for the sake of convenience. A care was taken to drive out the remaining air bubbles by tilting the jar in different directions. More HCl was added to fill up the jar to the most of its capacity. The jar was then completely covered with a glass lid to protect the contents from dust, and was allowed to stand at room temperature

for 48 hours (2 days).



Covered glass jar showing immersion of glassware in 1 N HCl.

Similarly, the pipettes were immersed in 1 N HCl taken in 1 litre cylinder, which itself was first rendered iron-free in the same way as described for the jar above. The cylinder was covered with a glass lid to protect the contents from dust and was allowed to stand at room temperature for 48 hours (two days)

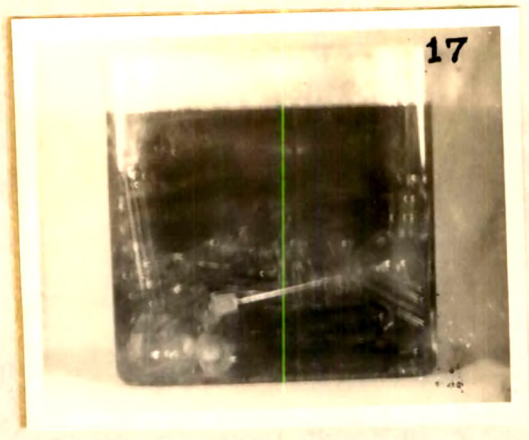
Covered cylinder showing immersion of pipettes in 1 N HCl.

(3) Rinsing with Distilled Water :

In order to remove the acid all the glass articles were individually rinsed several times with triple-glass distilled water. Syringes were rinsed thoroughly to prevent the clotting of blood during collection of blood samples.

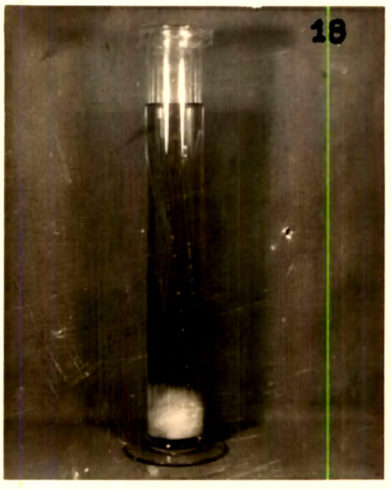
(4) Immersion in Distilled Water :

A second glass jar was selected for this purpose. The jar itself was rendered iron-free and was thoroughly rinsed with triple-glass-distilled water. Then, the jar was filled with triple-glass-distilled water and the glassware was immersed in the water. The jar was completely covered with a glass lid and was allowed to stand for 24 hours (1 day).



Covered glass jar showing immersion of glassware in triple-glass-distilled water

Similarly, the pipettes were immersed in 1 litre cylinder containing triple-glass-distilled water. The cylinder was covered with glass lid and was allowed to stand for 24 hours (1 day).

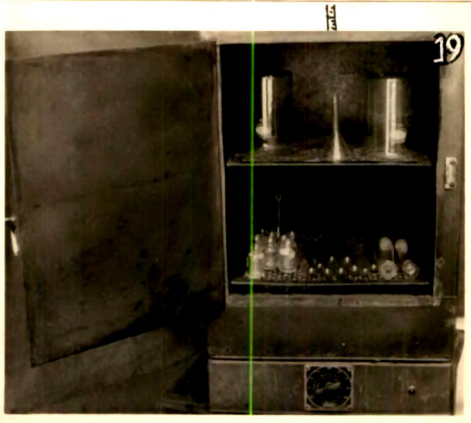


Covered cylinder showing immersion of pipettes in triple-glass-distilled water

(5) Drying :

At the end of the specific time, all the glass articles including the pipettes were removed from the jar or cylinder and excess of water was removed. Then, they were put in the

hot air oven at 150°c for 1 hour to ensure complete drying.



Drying of the glassware
in hot air oven

(6) Storage :

The glassware rendered "iron-free" thus, was ready for the use next morning. Till then, it was stored carefully and protected from dust.

(7) Arrangement :

Just before use, the glass articles were taken out from the dust-proof container and were arranged in suitable rows to facilitate the labelling. In order to prevent the pipettes from coming in contact with the dust, if placed horizontally on the table, they were arranged on a clean metal stand.

Metal stand showing prepared pipettes arranged for ready use

(8) Labelling :

Thereafter, 1 row of plain bulbs, 2 rows of centrifuge tubes, 3 rows of small test tubes etc. were EACH labelled as B, S_1, S_2, & T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, and T_9. The labelling was ~~as~~ carried out with water-proof ink.

(9) Next Cycle :

After the use, the glass articles were washed in running tap water and were immediately transferred to soap solution for immersion in the same. Then, the whole cycle was subjected to repeatation.

Each time fresh 1 N HCl was used to rinse the jar and cylinder as also for the immersion of the glassware in either of them. Similarly, each time fresh triple-glass-distilled water was used to rinsed the jar and cylinder as also for the immersion of glassware in either of them.