An integral part of the plastination process is dehydration of specimens, a process which replaces the tissue fluid (water) and fats with an organic solvent. To be a dehydrating agent, the solvent must be miscible with water and may consist of a variety of chemical structures (ketones or alcohols). Either alcohol or cold acetone may be used as dehydrant for plastination. Cold acetone (−25°C) is usually the best solvent for dehydration. An accumulation of waste acetone during plastination (contaminated with water and fats) necessitates not only the purchase of new acetone and also the disposal of the old acetone as a hazardous waste. In the present study, the purity of the recycled acetone was 99%. The instrument designed was very handy and needed very less investment as it does not involve any sophisticated instruments.

**Key words:** Acetone, Dehydrant, Plastination, Recycling

The diluted or acetone to be recycled was collected and its purity was recorded using acetonometer. Among the three acetone changes carried out, the acetone-I was 81%, acetone-II was 90% and the acetone-III was 97-99% pure. The acetone-III can be directly reused without any recycling. However, acetone-I and II needs to be recycled. The impure acetone was heated in a temperature controlled water bath to 60°C. As the boiling point of acetone is 56.5°C, it started boiling and vapours of acetone were made to pass through polyethylene vacuum tubing into the stainless steel chamber. The upper portion of the chamber was filled with ice cubes. As the acetone vapours passed through the copper tubing in the upper portion of the chamber, the ice cubes in the chamber condensed the acetone vapours into liquid and the condensed acetone got collected in the lower portion of the chamber. The acetone thus collected was checked for its purity using...

---

**Fig. 1.** Indigenous acetone recycling unit.
acetonometer. Since the water bath was maintained at 60°C only acetone got vaporized leaving only water and other contaminants in the glass container.

In the present study, the purity of the recycled acetone was 99%. The instrument designed was very handy and locally made. The water bath, glass cylinders and acetonometer were already existed in the laboratory. With every cycle, nearly 74-75% of the total acetone was obtained with purity of nearly 99%. Each cycle took about 65-70 minutes for recycling 2 litres of used acetone and every day nearly 12-14 litres of acetone were recycled. Using this unit, 394 litres of used acetone were recycled and nearly 75% of acetone i.e. 296 litres with purity of more than 99% could be recovered. This made the plastination procedure more economical.

According to Roark (1992) the recycling system must have a distillation system with sufficient theoretical plates to achieve the separation and he also reported that formation of paraformaldehyde from formalin contamination was a problem. Such drawbacks were not encountered in the present recycling unit. Grondin and Brube (1992) explained a simple and inexpensive method for recycling used acetone in plastination laboratories which involved a freeze separation, vacuum distillation and physical extraction of water, with recycling acetone at a rate of 500 to 600 ml/h and reach up to 97% purity. However, in the present study the procedure was very simple, faster and more economical. The additional expenditure on these equipments could be avoided. This procedure was very safe as it was carried out in a well ventilated laboratory. This indigenously designed procedure being simple, safe, efficient and more economical, can be used to recycle used acetone.

REFERENCES
