Comments and Communications

Planchets for Radioactive Material

Radioactive materials are commonly put on or into flat or cupped planchets for convenience in handling and to obtain uniform conditions during activity measurements. These planchets are made of glass or some metal such as steel or copper. According to Albert Margnatti (*Tracerlog No. 22,* October, 1949) the best material for this purpose is one with the lowest possible atomic number, because backscattering is thus reduced. On this basis, aluminum becomes the material of choice.

In using planchets of glass or sheet metal, economy requires that they be cleaned and reused if possible. Much time and work could be saved if the planchet were disposable. After some experimentation, the writers have succeeded in producing planchets of aluminum foil which are so easily and cheaply made that they can be discarded after use.

The material finally selected was aluminum foil 0.001 in. thick. This can be purchased at grocery stores in rolls 1 ft wide and 25 ft long. Dies for forming the planchets were made as shown in Fig. 1. The upper

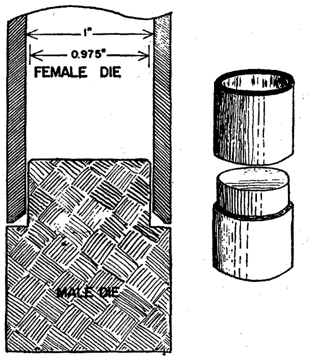

FIG. 1.

part is a 6-in. length of metal tubing with an inside diam of 1 in. The inner edge of one end is beveled slightly. The lower part is a 1¼-in. round steel bar with ½ in. of the end turned down to 0.975 in. Again the sharp edge is beveled slightly. The loose fit permits crimping of the cup without tearing of the foil.

Aluminum foil disks 1½ in. diam are cut on a sheet metal punch. By folding large strips of the foil into packs as many as 50 disks can be cut at once. After separation, these disks are placed on the die and formed. The crimped edges of the cup give it sufficient rigidity for most uses, and heavier cups can be made in the same dies by using two or more thicknesses of the foil, or heavier foil. Flat planchets must be made of foil at least 0.005 in. thick.

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Note on the Freezing Point of Citrate Solutions Used in the Dilution of Bull's Semen

In a recent paper on the freezing point of bull's semen and of the sodium citrate solutions used in diluting the semen for artificial insemination purposes, G. W. Salisbury, C. B. Knodt, and R. W. Bratton (*J. animal Sci.,* 1948, 7, 283) have stated that "heating sodium citrate solutions increases their osmotic pressure. For heated solutions 2.9 grams of $Na_3C_6H_5O_7 \cdot 2H_2O$ per 100 ml of water distilled in glass is isotonic with blood." In view of the stable nature of sodium citrate, it appeared unlikely that the number of osmotically active particles should increase irreversibly when solutions of the salt were heat-treated. This point, which is of interest in connection with research in progress here on semen diluents, was, therefore, investigated by experiment.

Freezing points were determined by the Hortvet technique as used for milk in an improved model of the cryoscope developed at this institute (Temple, P. L. *Analyst,* 1937, 62, 709). The thermometer had been standardized at the National Physical Laboratory, and all thermometer readings were corrected to the International Temperature Scale as recommended by R. Aschaffenburg and J. A. Hall (*Analyst,* 1949, 74, 380). The freezing point of water was determined at the beginning and end of each set of tests.

EXPERIMENT 1

Solution A. $Na_3C_6H_5O_7 \cdot 2H_2O$ of reagent quality (2.9 g) was made up to 100 ml with glass-distilled water at 15° C.

Solution B. $Na_3C_6H_5O_7 \cdot 2H_2O$ (2.9 g) was dissolved in boiling distilled water, transferred with hot water (just off the boil) to a 100-ml measuring flask and, after cooling, made up to the mark.

Freezing point depressions in degrees Centigrade:

	Solution A	B
	0.525	0.525
	0.524	0.527
	0.525	0.525
Mean	0.525	0.526

EXPERIMENT 2

Solution C. Made up like Solution A, Experiment 1.

Solution D. Made up like Solution A, Experiment 1. The flask containing the solution was then immersed in boiling water for 6 hr, cooled to 15° C, and made up to the mark.

Freezing point depressions in degrees Centigrade:

	Solution C	D
	0.527	0.526
	0.525	0.527
	0.527	0.528
Mean	0.526	0.527