



- ◆ With thermistor probes jacketed for use in aqueous or non-aqueous solvent systems
- ◆ Accuracy within $\pm 1\%$ in the 5000 number average range*
- ◆ Temperature range 30-70°C without modification

Provides values for calculation of number average molecular weights up to 5000*, with an accuracy within $\pm 1\%$, on single-drop samples of centimolal solutions. Usable with aqueous or non-aqueous, polar and non-polar liquids. Temperature range, without modification, 30 to 70°C; lower and higher temperatures may be obtained with accessory heating and cooling equipment. Serial determinations can be made in minutes following approximately 1 hour set-up period. Method is essentially that described by J. J. Neumayer in *Analytica Chimica Acta*, 20, 519 (1959).

Principle. In an equilibrium system, condensation takes place on the surface of a solution exposed to saturated vapor of its solvent. The heat transferred causes a slight increase in temperature of the solution. In the same system an equivalent surface of liquid solvent will remain at a constant temperature because the rate of vaporization and condensation is the same. The rate of condensation and heat transfer to the

solution, and thus the rise in temperature produced, is proportional to the mole fraction of solute in the solution. The temperature rise, or any proportional effect which it produces, can be used to calculate the molecular weight of solute in solutions of known concentration.

Technique. Two thermistors are used to measure temperature difference between solvent and solution in a solvent vapor chamber thermostatically controlled within $\pm 0.003^\circ\text{C}$. Samples are applied to thermistor tips by means of micrometer syringe pipets. Provision is made for delivery of solvent to both thermistors, and for subsequent delivery of solution to the measuring thermistor. Readings made with only two dilutions of a known sample suffice to establish the molar constant for a given solvent. Change in measuring thermistor resistance is made by means of a high-sensitivity d.c. resistance bridge. Molecular weight can be calculated directly using the resistance value obtained. Conversion to temperature units is not required.

7253. Molecular Weight Apparatus, Thomas Isothermal Distillation, as above described. Complete with six syringe pipets, and directions. For use on 115 volts, 50 or 60 cycles a.c. 2,200.00

*usable to 10,000 with diminishing accuracy

Bulletin 141, giving detailed information, sent upon request



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Scientific Apparatus and Reagents

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