44454

E. R. Lippincott
University of Maryland

E. D. Becker
National Institutes of Health

P. R. Wakeling
WINC

RAMAN NEWSLETTER - the monthly publication of the Raman Technical Group of the Optical Society of America - is a means of rapid exchange of information between active workers in the field of Raman spectroscopy. Communications received by the first of the month will be in the readers' hands before that month is out. Contributions are welcomed from throughout the world, but it is hoped that all letters will be written in the English language. Reference to RAMAN NEWSLETTER by name in the scientific literature is not permitted; such citations should refer to "private communication" and then only if the author's permission has been obtained.

Address your written contributions to P. R. Wakeling, Co-ordinating Editor, RAMAN NEWSLETTER, 1613 Nineteenth Street, N. W., Washington, D. C. 20009.

TO REMAIN ON THE MAILING LIST, A WRITTEN SCIENTIFIC CONTRIBUTION WILL BE REQUIRED AT LEAST ONCE A YEAR FROM ALL INDIVIDUAL SUBSCRIBERS, IN ADDITION TO THE PAID SUBSCRIPTION MONEY.

Send orders to the Optical Society of America, 2100 Pennsylvania Avenue, Washington, D. C. 20037.

Miss P. R. Wakeling
Coordinating Editor
Raman Newsletter
1613 Nineteenth Street, N. W.
Washington, D. C. 20009

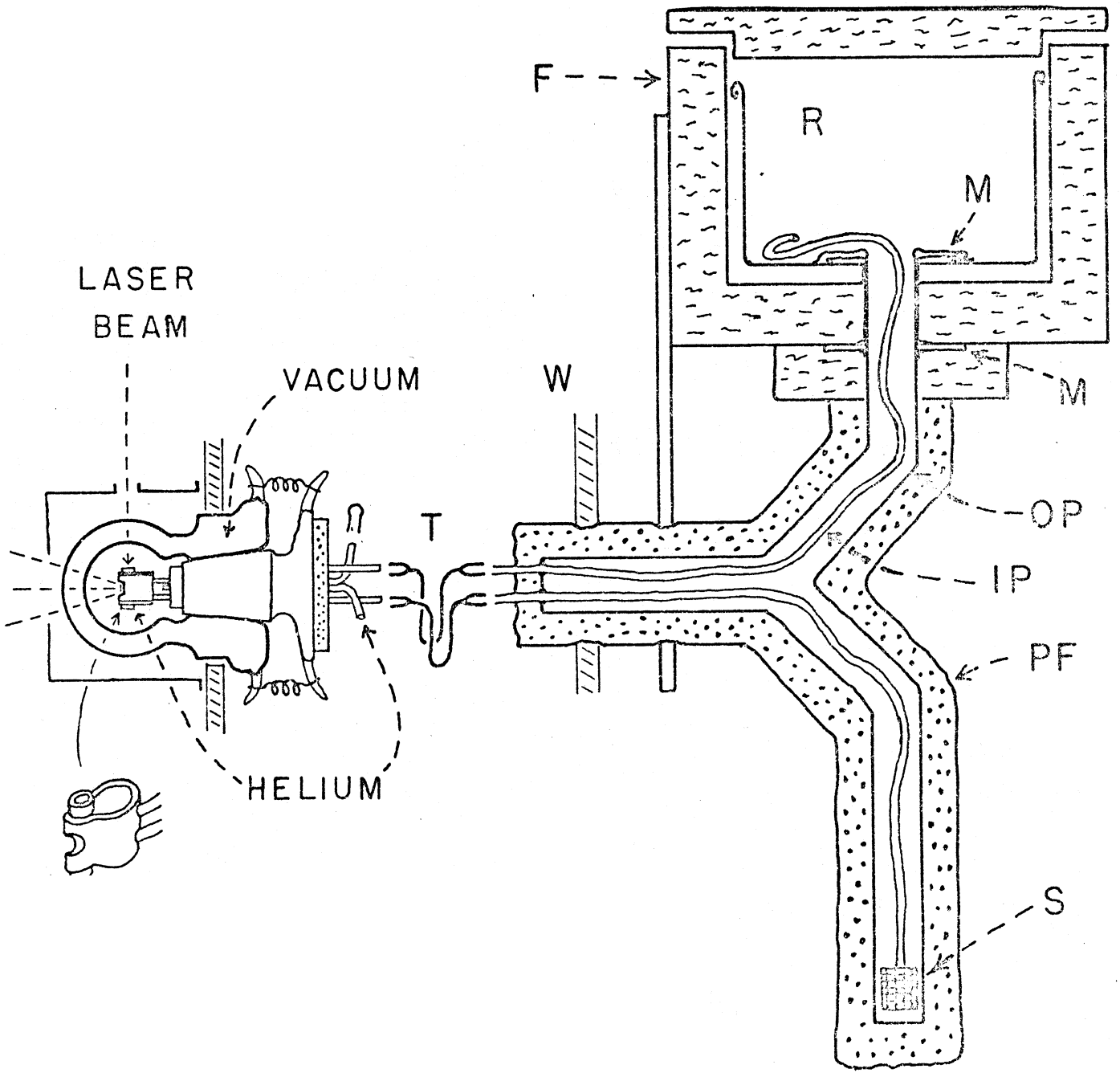
Dear Miss Wakeling:

Simple Cryostat and Low Temperature Raman Cell

In our work with polycrystalline organic materials, it has become quite obvious that cooling to liquid nitrogen temperature results in a marked improvement of most spectra and permits measurements closer to the exciting line. It also helps to prevent decomposition when a powerful laser beam is focused on a solid sample. For these purposes no gradual temperature regulation is required. We have designed a simple and inexpensive cryostat which uses liquid nitrogen as a refrigerant, requires very little space in the sample compartment, and minimum attention while in operation. The attached figure presents a schematic description.

R is a 1 gallon reservoir of liquid nitrogen (size reduced out of proportion in the drawing). OP is a copper pipe of 13 mm inner diameter, IP is a copper pipe of 2.5 mm i.d. and 3.2 mm o.d., F is foam plastic (polystyrene) insulation of ca. 5 cm thickness, PF foam rubber ("Armaflex") insulation for the copper pipes. S is a screen to keep possible dirt out of the cell, T flexible Teflon connections to the Raman cell, W the wall of the sample compartment, and M metal rings to assure rigidity. The cryostat and cooling chamber of the cell are filled with liquid nitrogen. As the refrigerant slowly evaporates in the cooling chamber, small bubbles escape through the upper portion of the inner pipe and fresh liquid nitrogen is supplied by the lower pipe. Our reservoir holds ca. 3 l of liquid nitrogen; the rate of consumption is ca. 0.6 l/hr.

The cell is schematically shown on the left of the drawing. It is made of Pyrex, except for the cooled sample holder, the pipes for liq. N_2 and He gas (supplied once, for heat conduction) and the glass-to-metal seal. The cell is made for pressed pellets but can be easily modified for capillary tubes or single crystals. To facilitate focusing, flat windows can be installed where the laser beam enters the cell. We have obtained good results without this refinement.


F
R
M
LASER
BEAM
VACUUM
W
M
T
OP
IP
PF
HELIUM
S

The chief favorable characteristics of the described cryostat are low price, efficient cooling, simple operation, flexible connections from cryostat to Raman cell, and the fact that the bulk of the apparatus is outside the sample compartment.

Sincerely,

Heino Susi

Heino Susi, Research Chemist
Physical Chemistry Laboratory

Jesse S. Ard

Jesse S. Ard, Research Chemist
Physical Chemistry Laboratory

Printing and distribution of RAMAN NEWSLETTER

courtesy of Sadtler Research Laboratories, Inc.

RAMAN NEWSLETTER is a publication of the Raman

Technical Group of the Optical Society of America.