

of the cell interior to be enlarged to fill the entire monitor screen.

The electronic signal generated by the CCTV camera is generally fed to the video tape recorder, and from it another signal is passed on to the CCTV monitor. This provides a check on what is actually being recorded.

TESTING THE SYSTEM

A phase equilibria cell with a 1×4 cm rectangular window was used. Before assembly, the rear of the cell interior was coated with a mixture of the fluorescent pigment and polystyrene Q-Dope, a low loss coil coating manufactured by GC Electronics. When dried, this even coating resisted any effects of temperature cycling from 77 K to ambient temperature.

The assembled cell was placed in a gas bath cryostat,² cooled to 100 K, and pressurized to 25 MN·m⁻² with a helium-nitrogen mixture. With all components (except the front surfaced aluminum mirror and the flint glass) functioning, the level of the liquid mixture in the cell was raised and lowered by admitting more gas and draining the liquid, respectively. The meniscus appeared as a distinct group

of black and white bands on the monitor. The contrast at the interface was excellent. Any changes in the meniscus were easily followed.

Several combinations of lens extensions were tried with the resulting changes in image magnification. The best results were achieved with an extension of 40 mm which yielded an image magnification of approximately 21×. The illumination of the cell interior was sufficiently intense to permit closing the lens aperture several stops.

No difficulties are expected to result from increasing the pressure to 70 MN·m⁻² and lowering the temperature to 20 K. The effect of pressure on the luminescent efficiency should be negligible³. The reduced temperature might narrow the emission peak and increase the output, approaching a maximum near absolute zero.⁴

¹ Mention of specific products is for identification only and does not imply endorsement by the Bureau of Mines.

² W. E. DeVaney, L. Rhodes, and P. C. Tully, *Cryog. Technol.* 7, No. 1 (1971).

³ H. W. Leverenz, *An Introduction to Luminescence of Solids* (Dover, New York, 1968), p. 152.

⁴ Ref. 3, pp. 136-46.