

XVIII. ELECTRONIC PROPERTIES OF CHARGED CENTERS  
IN SiO<sub>2</sub>-LIKE GLASSES

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A vacuum-ultraviolet optical system has been constructed to examine photoluminescence from SiO<sub>2</sub>. The system consists of a McPherson 218 vacuum monochromator, a McPherson Hinteregger hydrogen discharge lamp, and a high-vacuum optical system. The cost of this system (about \$25,000) was furnished almost entirely by a Cottrell Grant from Research Corporation and M. I. T. funds.

A major modification of the lamp was necessary to provide stable continuous operation. This has now been completed. An improvement over previous designs allows quite long periods of stable operation.

The first measurements on Supersil fused quartz indicate that luminescence can be excited by photons with energies near the band gap even at room temperature. Many other measurements are needed to ascertain whether this photoluminescence is, as we predicted, similar to that observed at valence-alternation defects in chalcogenide glasses.

The next stage in our program is to measure the temperature dependence of the luminescence. For this a liquid He temperature cold finger must be added to our optical system. We have, so far, measured only the excitation spectrum of the luminescence. Modifications of the optical system will be made to measure the luminescence spectrum as well.

