

XVI. ELECTRONIC PROPERTIES OF CHARGED CENTERS
IN SiO₂-LIKE GLASSES

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We have demonstrated that vacuum-ultraviolet excitation of pure silicon dioxide causes luminescence. We believe that the luminescence centers are intrinsic defects. Excitation and luminescence spectra have been measured for suprasil (containing about 10^3 ppm OH) and suprasil W (much lower OH concentration). Since the spectra and quantum efficiency are the same, OH is not important in the luminescence process. The luminescence has a large Stokes shift: the excitation band is approximately 0.8 eV wide, centered at 7.6 eV; the luminescence is approximately 1.5 eV wide, centered at about 4 eV. A 7.6-eV optical absorption band is known to be enhanced by neutron damage, strongly suggesting that it arises from an intrinsic defect. Neutron irradiation of samples to enhance the luminescence is now under way.

