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**Optical band gap of bismuth vanadium borate glasses** MAZHARUL ISLAM MONDAL, P.K. BABU, SAISUDHA MALLUR, Western Illinois University — The optical band gap ( $E_{\text{opt}}$ ) is an important parameter that depends on the electronic band structure of a glass and therefore, can serve as a basis to investigate the variation in the band structure. Heavy metal oxide glasses containing  $V_2O_5$  have potential applications in optoelectronic devices and electrochromic display devices. We prepared bismuth vanadium borate glasses with the composition  **$30\text{Bi}_2\text{O}_3-(70-x)\text{B}_2\text{O}_3-x\text{V}_2\text{O}_5$**  ( $x= 0.1, 1, 2, 3, 4$  mol%) and studied the optical absorption spectra of this ternary system as a function of vanadium composition. We carried out a detailed analysis of the optical absorption edge using the Mott-Davis model and determined  $E_{\text{opt}}$  for all these glasses. We found that, with increasing  $V_2O_5$  content, the absorption edge shifts towards longer wavelengths and the optical band gap decreases from 2.63 eV to 2.33 eV. The type of transition between the valence band and the conduction band is determined to be indirect allowed transition.

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