

Vibronic intensities in the electronic spectra of transition metal complex ions.  
part IX. experimental study of the relative vibronic intensities in the  ${}^2E_g \rightarrow {}^4A_{2g}$   
transition of the  $Mn^{2+}$  ion in  $Cs_2SiF_6$

Acevedo, R.

Vasquez, S. O.

Flint, C. D.

The relative intensities of about 90 of the more prominent vibronic bands in the  ${}^2E_g \rightarrow {}^4A_{2g}$  luminescence spectrum of the  $Mn^{2+}$  ion in  $Cs_2SiF_6$  have been measured at 80 K. The reported intensities cover a range of more than  $10^6$ . Corrected values of the important intensity ratios of the  $\nu_3$ ,  $\nu_4$ ,  $\nu_6$  vibronic origins are given as 1:4.02:5-45. Most of the features can be assigned as progressions in the  $\nu_1$ ,  $\nu_2$  even parity vibrational modes based on the magnetic dipole allowed electronic origin and the  $\nu_3$ ,  $\nu_4$ ,  $\nu_6$  odd parity vibronic origins, up to four members of the progressions being observed. Prominent features also include combinations of the three odd vibrational modes. Anharmonic effects are small. The intensity mechanisms of these features are briefly discussed. It is likely that second order and third order Herzberg-Teller vibronic coupling makes a significant contribution to the intensity mechanism. These data will be used in subsequent theoretical models of the intensity mechanism. © 1