THE MILLIMETER/SUBMILLIMETER SPECTRUM OF AlSH ($\tilde{X}^1A'$): FUTHER INVESTIGATION OF METAL HYDROSULFIDE STRUCTURES

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The pure rotational spectrum of AlSH has been recorded using millimeter/submillimeter wave direct absorption techniques. The molecule was produced by reacting aluminum vapor with H_2S in the presence of a d.c. discharge. Transitions ranging from J = 23 $\rightarrow$ 24 to J = 30 $\rightarrow$ 31 in the region 319 - 418 GHz were measured. The spectra exhibited K_a ladder structure for K_a = 0 to K_a = 6 for the species, which is consistent with the molecule being an asymmetric top. The higher asymmetry components (K_a = 5,6) are, however, perturbed. Rotational constants as well as an r_o structure have been determined. The study shows that the AlSH molecule is bent and therefore different from linear AlOH.