THE PERMANENT ELECTRIC DIPOLE MOMENTS AND MAGNETIC HYPERFINE INTERACTON IN THE $A^2\Pi$ STATE OF YTTRIUM MONOSULFIDE, YS

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The optical Stark effect in the (0,0) $A^2\Pi - X^2\Sigma^+$ band systems of a yttrium monosulfide, YS , supersonic molecular beam sample have been analyzed to produce permanent electric dipole moments, μ, for the $A^2\Pi_{3/2}$, and $A^2\Pi_{1/2}$ states of 5.9(2) D, and 6.8(1) D, respectively. Fine structure splitting in the field free $A^2\Pi_{3/2} - X^2\Sigma^+$ and $A^2\Pi_{1/2} - X^2\Sigma^+$ spectra were analyzed to produce the magnetic hyperfine spectroscopic parameters a = -36(6) MHz, c = 111(7) MHz, and d = -107(6) MHz for the $A^2\Pi$ state. Transition frequencies of the low rotational lines in the (0,0) $A^2\Pi_r - X^2\Sigma^+$ band system were measured and analyzed to produce the first complete set of fine structure parameters for the $A^2\Pi_r$ state.