THE MgH $B'^2\Sigma^+ - X^2\Sigma^+$ TRANSITION: A NEW TOOL FOR STUDYING MAGNESIUM ISOTOPE ABUNDANCES

LLOYD WALLACE, KENNETH HINKLE, *Kitt Peak National Observatory, National Optical Astronomy Observatories, Tucson, AZ 85726*; EDWARD G. LEE, and PETER F. BERNATH, *Department of Chemistry, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada*.

We have identified lines from the 0-3, 0-4, 0-5, 0-6, 0-7, 1-3, 1-4, 1-7 and 1-8 bands of the ^{24}MgH $B'^2\Sigma^+$ - $X^2\Sigma^+$ transition in sunspot umbral spectra. Lines of the 0-7 and 1-8 bands in the uncluttered 7500 Å region are the most obvious but $B'^2\Sigma^+$ - $X^2\Sigma^+$ lines have been tracked as far to the blue as 5300 Å. Using the weak lines of the 0-7 band of the minor ^{25}MgH and ^{26}MgH isotopomers, the solar isotope ratio ^{24}Mg:^{25}Mg:^{26}Mg has been measured as 76:12:12, in agreement with the much better determined terrestrial ratio 79:10:11. The intensity distribution of bands with v'' from 4 to 8 has been measured and found to show no anomalies; the excitation temperature of 3100 K agrees well with a value of 3200 K determined from SiO in a sunspot spectrum. The lines of the MgH $B'^2\Sigma^+$ - $X^2\Sigma^+$ are much more clearly separated and much less blended than lines from strong $A^2\Pi - X^2\Sigma^+$ transition. The $B'^2\Sigma^+ - X^2\Sigma^+$ lines should prove useful in isotopic abundance analyses for stars where the $A^2\Pi - X^2\Sigma^+$ transition is too strong to yield useful results.