OPTICAL STARK SPECTROSCOPY OF RHODIUM CONTAINING MOLECULES: RhN[a].

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Rhodium is very important in both the homogeneous and heterogeneous catalytic induced chemical modification of nitrogen containing molecules. The only practical means of gauging the quantitative predictability of either *ab initio* and DFT computations used to model catalysis is by a comparison of experimental and predicted properties of bound Rh containging molecules. Here we report on the optical Stark effect in the Q(1) and R(0) lines of the [15.1]1 - $X^1\Sigma^+$ (1,0) band of rhodium mononitride, RhN, which were analyzed to determine the permanent electric dipole moments, μ, for the $X^1\Sigma^+$ (v=0) and [15.1]1 (v=1) states to be 2.43(5)D and 1.75(1)D, respectively. TJe determined dipole moments are compared with predicted values obtained from DFT[a] and an all-electron *ab initio* calculation[b]. A simple molecular orbital correlation diagram is used to rationalize the relative values of μ for RhN, isovalent IrN[c] and RhO[d]. Bonding in the 4*d* metal containing nitrides, as revealed from an interpretation of μ, will be presented.

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