COMPARISONS OF THE STRUCTURE AND SPECTROSCOPY OF THE $\mathrm{M} \cdot \mathrm{XH}(A^2\Sigma^+)$ (M=Ne, Ar, Kr; X = O,S) COMPLEXES.

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Over the past several years we have performed high resolution spectroscopic experiments on the $\mathrm{M} \cdot \mathrm{XH}(A^2\Sigma^+)$ (M=Ne, Ar, Kr; X = O,S) family of complexes. Based on these studies, we have fit a set of empirical potential surfaces that reproduce the experimental band origins to within 1 cm^{-1} and the rotational constants to within 1%. In this talk, we will discuss these potentials and the experimental spectroscopic trends in this class of systems. In the case of $\mathrm{Ne} \cdot \mathrm{SH}$, the most weakly bound of these species with a D_0 of 41 cm^{-1}, only one quantum of excitation in either of the van der Waals modes is necessary to allow the complex to sample both the Ne-SH and the Ne-HS minima on the potential. In contrast, in the most strongly bonded case of the $\mathrm{Kr} \cdot \mathrm{OH}$ complex, D_0 is 1772 cm^{-1}, and all of the assigned states are found to be localized in the Kr-HO minimum of the potential. Manifestations of this range of bonding, from van der Waals to near covalent in strength, in the spectroscopic constants will also be discussed.