

Structure Data of Free Polyatomic Molecules

229 LIF	HNeS	Mercapto – neon (1/1) (weakly bound complex)		$C_{\infty v}$ (effective symmetry class) (large-amplitude motion) Ne · SH
		State	$\tilde{X}^2\Pi$ $\tilde{A}^2\Sigma^+$	
		Energy [eV]	0.00	
		$r_0(\text{Ne}\dots\text{H}) [\text{\AA}]$	2.9006	2.485
		$r_0(\text{Ne}\dots\text{D}) [\text{\AA}]$	2.8813	2.463

A mixture of *ca.* 1% H₂S/D₂S in helium to which 1...5% of neon was added, was expanded into a vacuum chamber and radicals were produced by laser photolysis. Fluorescence was excited by a probe laser derived from a CW dye laser which was pulse amplified and frequency doubled. By scanning the dye laser, spectra of the Ne · SH/SD radicals were obtained. Rotational analysis provided molecular constants from which structural information was derived. In both the $\tilde{X}^2\Pi$ and $\tilde{A}^2\Sigma^+$ states the Ne · SH van der Waals complex is best described as a nearly free SH whose rotation is slightly hindered by the presence of the Ne atom.

Carter, C.C., Miller, T.A.: J. Chem. Phys. **107** (1997) 3447.