

MICROWAVE SPECTROSCOPY AND STRUCTURE DETERMINATION OF  $\text{H}_2\text{S} - \text{MI}$  ( $\text{M}=\text{Cu}, \text{Ag}, \text{Au}$ )

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A series of hydrogen sulphide-metal iodide complexes ( $\text{H}_2\text{S}-\text{MI}$ ,  $\text{M}=\text{Cu}$ ,  $\text{Ag}$  and  $\text{Au}$ ) have been measured via chirped pulse Fourier transform microwave spectroscopy between 7.5-18 GHz. The complexes were generated in a supersonic expansion via laser ablation of the metal and decomposition of  $\text{CF}_3\text{I}$ . Experimental structures were obtained by least squares fitting of structural parameters to the rotational constants of deuterium and metal ( $^{63}\text{Cu} / ^{65}\text{Cu}$  and  $^{107}\text{Ag} / ^{109}\text{Ag}$ ) isotopologues. Interestingly  $K_{-1}=1$  transitions were observed in the spectra containing  $\text{D}_2\text{S}$ , these were not observed in previous studies of similar molecules ( $\text{H}_2\text{S}-\text{MCl}$ ). This allowed for the determination of an extra rotational constant and, consequently, extra structural information could be obtained. The structures are compared to high level coupled cluster theory calculations.