

## MICROWAVE SPECTRA, STRUCTURES AND HYPERFINE CONSTANTS OF GOLD(I) HALIDES.

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The microwave rotational spectra of AuF, AuCl, AuBr and AuI have been measured in the frequency range 6-22 GHz, using a cavity pulsed jet Fourier transform microwave spectrometer. The samples were prepared by ablating Au metal with a Nd:YAG laser (532 nm) and allowing the vapour to react with a precursor <1% in the Ar or Ne backing gas of the jet. The spectrum of AuF has confirmed that it can be made, in contrast to long-held ideas. The spectra of AuBr and AuI are the first high resolution spectra of any kind reported for these molecules. Equilibrium geometries, vibrational wavenumbers and dissociation energies have been obtained. The Au nuclear quadrupole coupling constants show wide variations between the molecules, which cannot be accounted for with simple theories.