SMALL SULFUR CLUSTERS IN THE GAS PHASE: PURE ROTATIONAL SPECTROSCOPY OF S_3 (THIOZONE) AND S_4

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The C_{2v} forms of thiozone, S_3, and tetrasulfur, S_4, have been investigated by Fourier transform microwave spectroscopy of a supersonic molecular beam. Both molecules represent the global minima on their respective potential energy surfaces. Besides the parent molecules the mono-^{34}S isotopomers have been investigated in natural abundance. For thiozone, a substantial number of vibrational satellites has been detected in addition. The analysis of the spectroscopic data will be discussed and a comparison to recent high-level quantum chemical calculations at the CCSD(T) level of theory will be given. From a calculation of the cubic force field the rotation-vibration interaction constants have been calculated and the mixed experimental-theoretical r_e structures have been obtained.