Non-covalent intermolecular interactions are important in structural biology. The N-H⋯π hydrogen bond between amino acid side chains is an important structural determinant and highly affects the secondary structure of proteins. The pyrrole-benzene complex can be viewed as a model system for studying these fundamental interactions. Previous IR and UV spectroscopic studies of the pyrrole-benzene complex by Dauster et al.\textsuperscript{a} and Pfaffen et al.\textsuperscript{b} support a T-shaped structure with an N-H⋯π hydrogen bond to the benzene ring. In order to obtain accurate structural information we have investigated the broadband rotational spectrum of the supersonic-jet cooled complexes of pyrrole with benzene and benzene-$d_1$ in the 2-18 GHz frequency range. In addition to the hetero dimer we have also observed the two cyclic mixed trimers (pyrrole)$_2$-benzene and pyrrole-(benzene)$_2$.
