THE CO-DIMER: THE MYSTERIOUS MOLECULE THAT WANTS TO BE COAXED CONTINUOSLY

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More than 20 years ago, Klemperer's group announced the "first observation" of this weakly bound Van der Waals complex, CO−CO, in the microwave region. But today we are certain of its existence, even so we do not know with confidence its geometrical structure nor do we know its term level scheme. In recent years significant progress has been made to solve some of the fundamental riddles associated with the CO-dimer. At the first step the Ottawa group has studied the infrared spectrum in the region of the CO stretching vibrations (2139 - 2152 cm^{-1}) while the Cologne group has characterised the CO-dimer's millimeter wave spectrum (130 - 174 GHz). Very recently the further millimeter wave measurements (60 - 105 GHz) were made by the Ottawa group. In combining the efforts of the two laboratories, we have succeeded in the assignment of many new states by using the technique of combination differences. A total of about 50 CO-dimer rotational levels in the ground state are now accurately known. The work on the CO-dimer is now extended to $^{13}CO-^{13}CO$ and the mixed isotopomers. This paper will give an overview of the present status of research.