

# **Study of complexation kinetics processes by rotational spectroscopy coupled with uniform supersonic flows**

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Homogeneous nucleation, which plays an important role in cloud and dust particle formation, consists of a succession of unions of small gas-phase molecules leading to the formation and growth of droplets and particles. At high degrees of supersaturation the rate-limiting step of nucleation is the complexation of the two smallest molecular species involved, known as dimerisation. We have employed an adaptation of the Chirped Pulse in Uniform Flow (CPUF) technique to study the gas phase kinetics of complexation processes. This technique employs the CRESU (reaction kinetics in uniform supersonic flow) method coupled with chirped-pulse Fourier transform millimetre-wave spectroscopy, combining the capability of generating continuous cold uniform supersonic flows at high degrees of supersaturation with the high selectivity and general applicability of rotational spectroscopy. We have studied the complexation kinetics of a number of different molecules including acrylonitrile and formic acid, and our latest results will be presented.