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Kinetic processes in complex thermally non-equilibrium plasma produced by shock wave ALEXANDER STARIK, ILYA ARSENTIEV, ALEXANDER SAVEL'EV, NATALIYA TITOVA, Central Institute of Aviation Motors — A comprehensive analysis of charged and neutral species formation in N2-O2-Ar and CO2-N2 systems containing nanoparticles behind strong shock wave is conducted on the basis of extended thermally nonequilibrium model with careful allowance for reactions with both vibrationally and electronically excited molecules, vibration-electron-chemistry coupling and charging of nanoparticles. The novel model is developed to describe with high accuracy the vibration-chemistry interconnection. The model is validated against various experimental data. Two principally distinctive modes of particle charging were revealed.

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