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Laboratory study of inelastic collisions of O2 with He at low temperature

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State-to-state rate coefficients for the inelastic collisions of O2 with He at low temperature are investigated by means of an experimental procedure based on supersonic gas jets probed by Raman spectroscopy. The procedure employs a kinetic master equation (MEQ) which describes the time evolution of the rotational populations of O2 along three supersonic jets of O2 + He mixtures. The MEQ is expressed in terms of experimental quantities (number density and rotational populations), and calculated rate coefficients for the O2:He and O2:O2 inelastic collisions from the literature. By scaling these rate coefficients, a satisfactory agreement with the experiments is accomplished for temperatures between 10 and 34 K.

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