

## **Study of electronic and vibrational kinetics of main atmospheric components in middle atmosphere**

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Very good agreement of calculated rate coefficients for O<sub>2</sub> and N<sub>2</sub> with laboratory experimental data allows us to search the transformation of electronic energy in molecular collisions. It is shown that collisional processes cause a transfer of the energy of the electronic excitation from nitrogen to oxygen molecules. The redistributions of O<sub>2</sub> electronic energy in intramolecular and intermolecular collisional processes cause the production of very chemically active high vibrationally excited molecular oxygen and "singlet oxygen".

The role of electronic and vibrational kinetics of molecular oxygen and molecular nitrogen in chemical balance of stratospheric ozone is investigated for the cases of solar proton events and the input of an additional energy in middle atmosphere. The possible role of the excited main atmospheric molecules in "ozone deficit" problem is discussed.