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Calculation of the rate of quenching of N(^{2}D) by O(^{3}P) in the thermosphere

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N(^{2}D) is an important constituent of the mesosphere and thermosphere, as a primary source of NO production via its direct reaction with O_2 as well as a source of N(^{4}S) which then can form NO via reaction with O_2 or destroy it to form N_2. The rate of quenching of N(^{2}D) by O(^{3}P) to form N(^{4}S) is thus a crucial quantity in that it affects the total density of NO, an important cooling agent in the thermosphere. In this poster, total scattering cross section data for electronic relaxation in the reaction N(^{2}D) + O(^{3}P)—> N(^{4}S) + O(^{3}P) are calculated by exact closed-coupled channels and mixed quantum-classical methods. Potential energy surfaces for these diatomic interactions are obtained by ab initio molecular orbital methods, with careful attention given to the relevant Rydberg excited states. Comparisons with available experimentally determined rate constants are presented.