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Plasmas for Fertilizers

This work explores the possibility of synthesis of NH_3 through plasma processes induced by an electrical discharge in a gas. The two-term approximation for the Boltzmann equation and the rate-balance system of equations are used as a self-consistent theoretical model for the study of this system, solved with a computational implementation which couples both with convergence cycles. Exploring the dependence of results on the main creation mechanisms included in the model and the current available experimental data, comparing to the simulation results, we hope to better understand the dynamics of the system and optimize ammonia production. Further work is necessary on simulation development, plasma diagnostics, chemistry model adjustment, as well as the possibility of applying machine learning tools to the generated data (simulated or experimental).

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