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(I) Some considerations about the description of non-equilibrium effects in neutral species kinetics

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Non-equilibrium effects are ubiquitous in laboratory plasmas and need to be considered to optimize the reactor performance for specific applications. In the low temperature plasma (LTP) community, there are on-going discussions on how to define reaction mechanisms and verify them. Such efforts would allow going toward predictive modelling and accelerate innovation. In this contribution, we will discuss a couple of cases illustrating different non-equilibrium effects which play a direct role in the yield of plasma (reactive) species. While external electric and magnetic fields come first to mind in controlling non-equilibrium plasma properties, we will focus more specifically on flow and wall effects. These effects are usually hard to quantify and generate additional challenges for constructing a plasma chemistry model and validating it. A better understanding (and/or control) of them would allow making significant steps forward in the development of predictive models. The current state-of-the-art will be outlined and steps toward the definition of reaction mechanisms discussed.

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Plasma chemistry

Keyword-2

reaction mechanism

Keyword-3

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