Combustion of Ammonia Mixed with Dimethyl Ether

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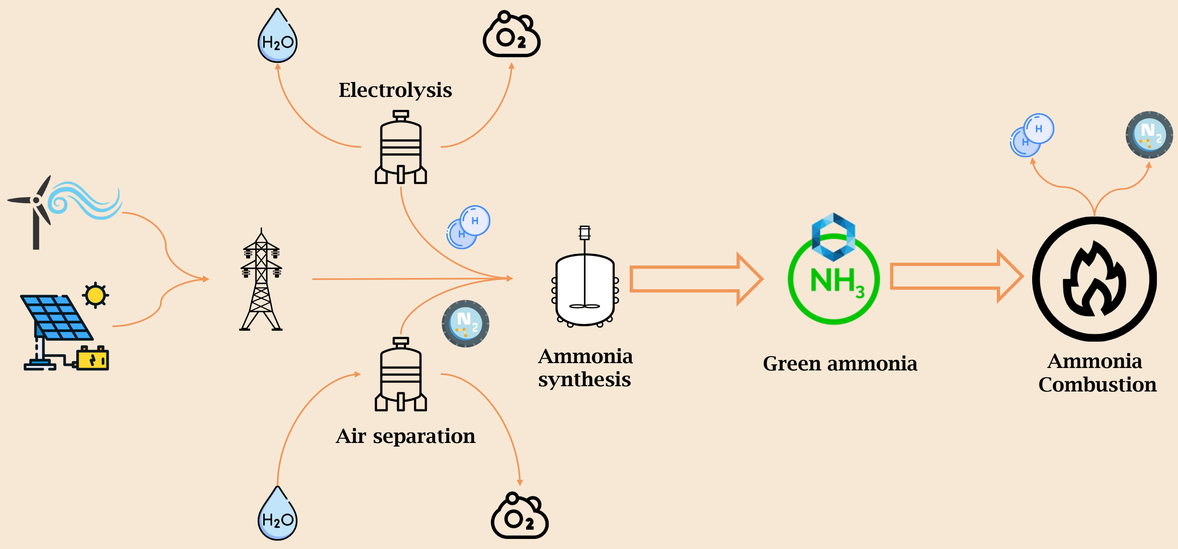
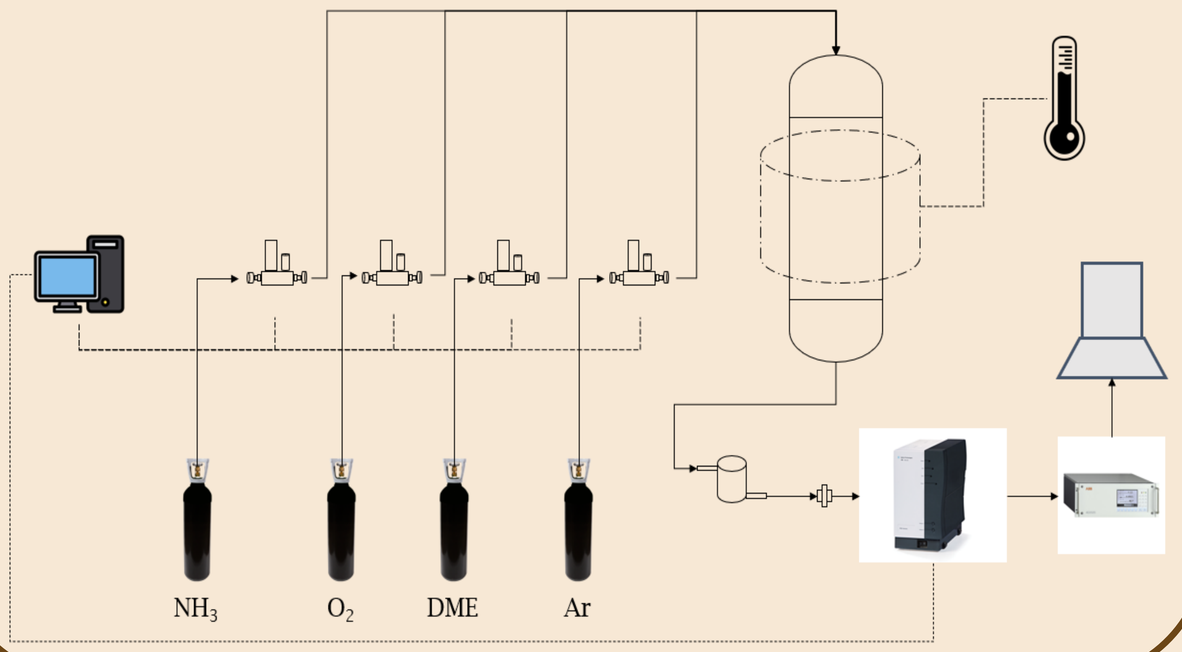
Introduction



Methodology



Experimental + Simulation

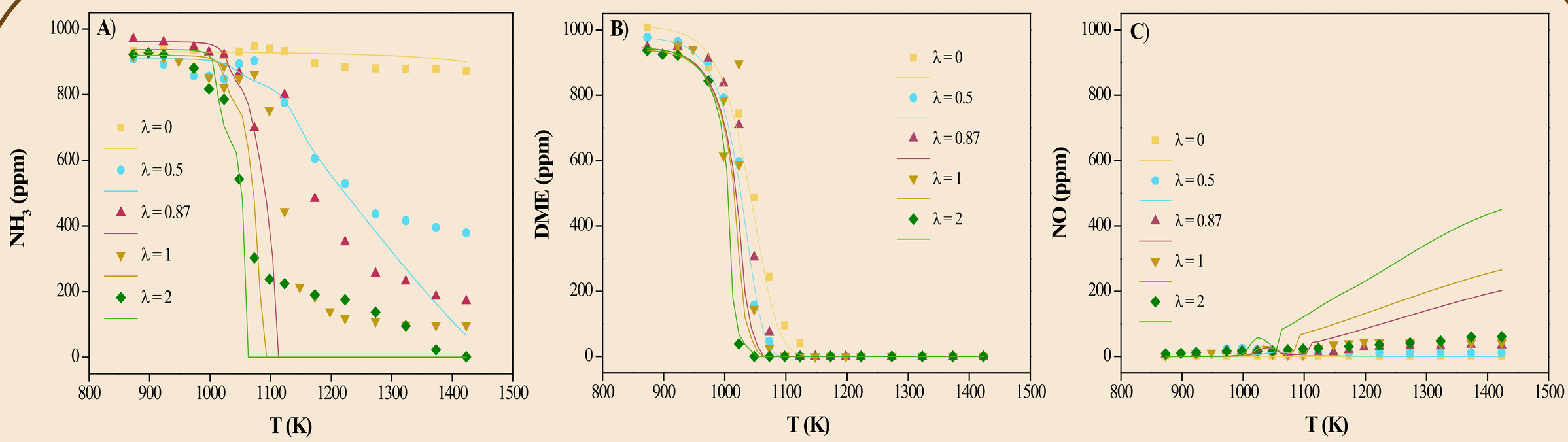


Figure 1. A) NH_3 concentration. B) DME concentration. C) NO concentration.

Simulation

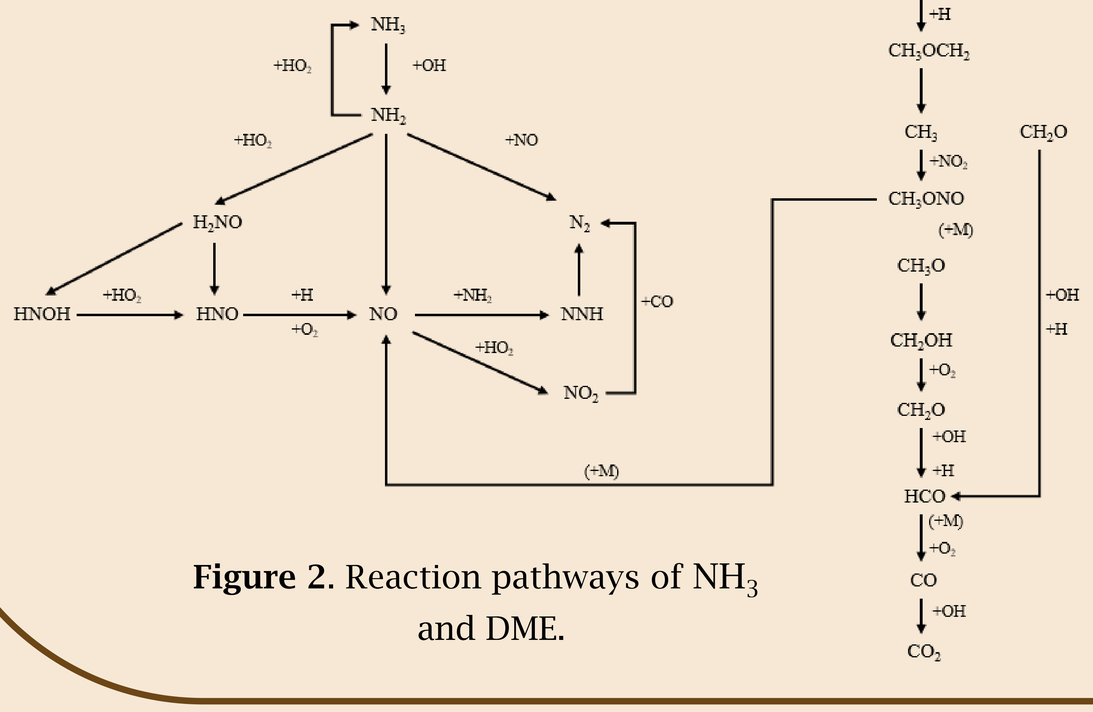


Figure 2. Reaction pathways of NH_3 and DME.

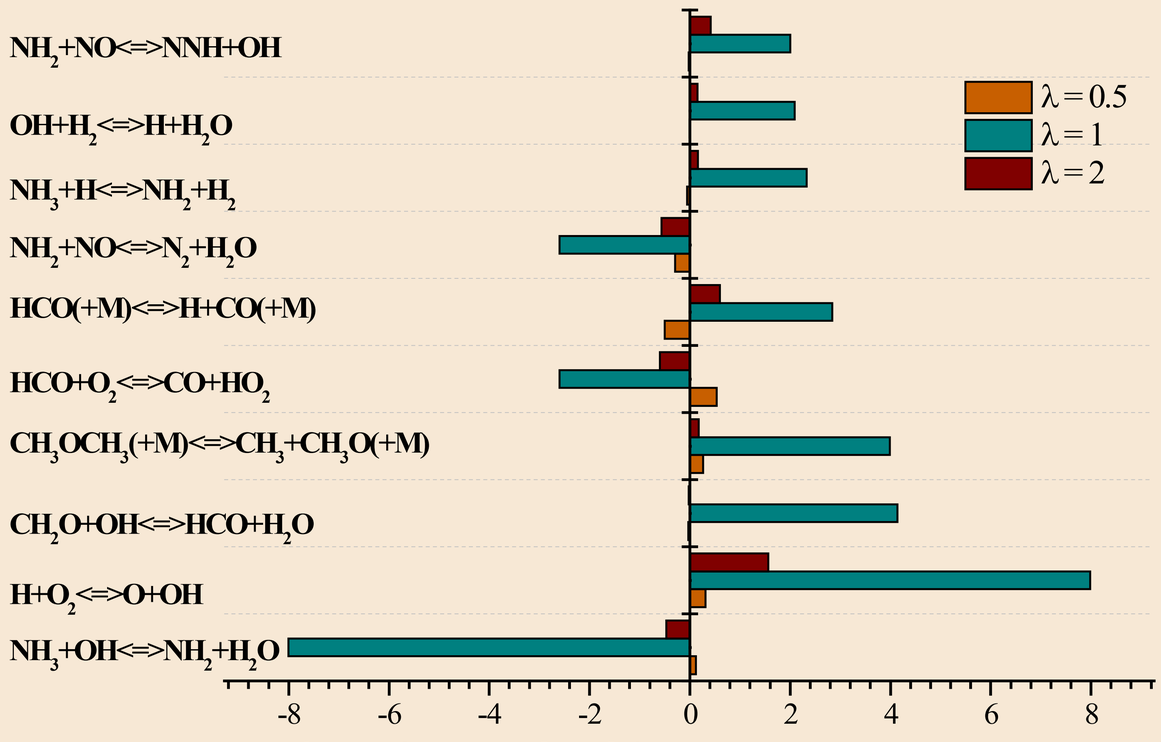


Figure 3. Normalized Sensitivity NH_2.

Conclusions

- NH_3 conversion occurs at lower temperature with excess of O_2.
- NO formation occurs at the highest temperatures studied with an ammonia yield to NO not higher than 62 ppm.
- NO formation is lower if the DME/NH_3 ratio increases.
- DME derived species interact with NO.
- NH_2 determines the NH_3 conversion.
- The presence of H/OH radicals promotes NH_2 conversion.
- Radicals formed from DME interact with NH_2, promoting its conversion.
- The reaction is globally shifted towards the formation of N_2 .

Acknowledgment

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