

## Electron discharge chemistry in exoplanetary CO<sub>2</sub>-rich atmospheres

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Electrical processes are expected to be a common process on planets. Lightning has been observed on Jupiter [1], Saturn [2], Uranus [3], Neptune [4], it is also possible in the atmospheres of Mars and Titan. Electrical processes may be crucial to increase chemical composition in prebiotic atmospheres.

In the present work we simulate the chemistry induced by electrical processes in CO<sub>2</sub> rich atmospheres. We study the influence of small amounts of NH<sub>3</sub> on the chemical network of these atmospheric analogues.

We irradiate a CO<sub>2</sub>:NH<sub>3</sub> (10:1) gas mixture at a pressure of 20 mbar. The gas composition was measured in real time by mass spectrometry and the ionized fraction was monitored by UV spectroscopy during the electrical discharge. UV spectroscopy highlights optical phenomena such as self-absorption, which could obscure a fraction of the emitted spectrum. The residue formed after electrical processing of each gas mixture was compared and analyzed by IR spectroscopy.

We found that abiotic processes such as electrical discharge are capable of producing organic compounds. The solid residue formed in the gas phase and deposited is strongly influenced by the presence of small amounts of NH<sub>3</sub>.

### References

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