

Supplemental Figures:

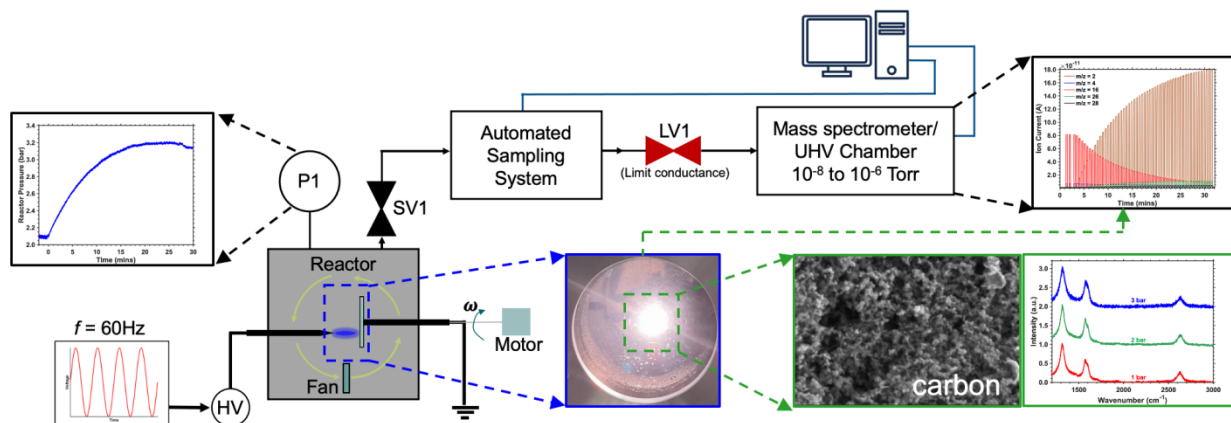


Figure 1. Schematic of plasma batch reactor and on-line mass spectrometry measurement.

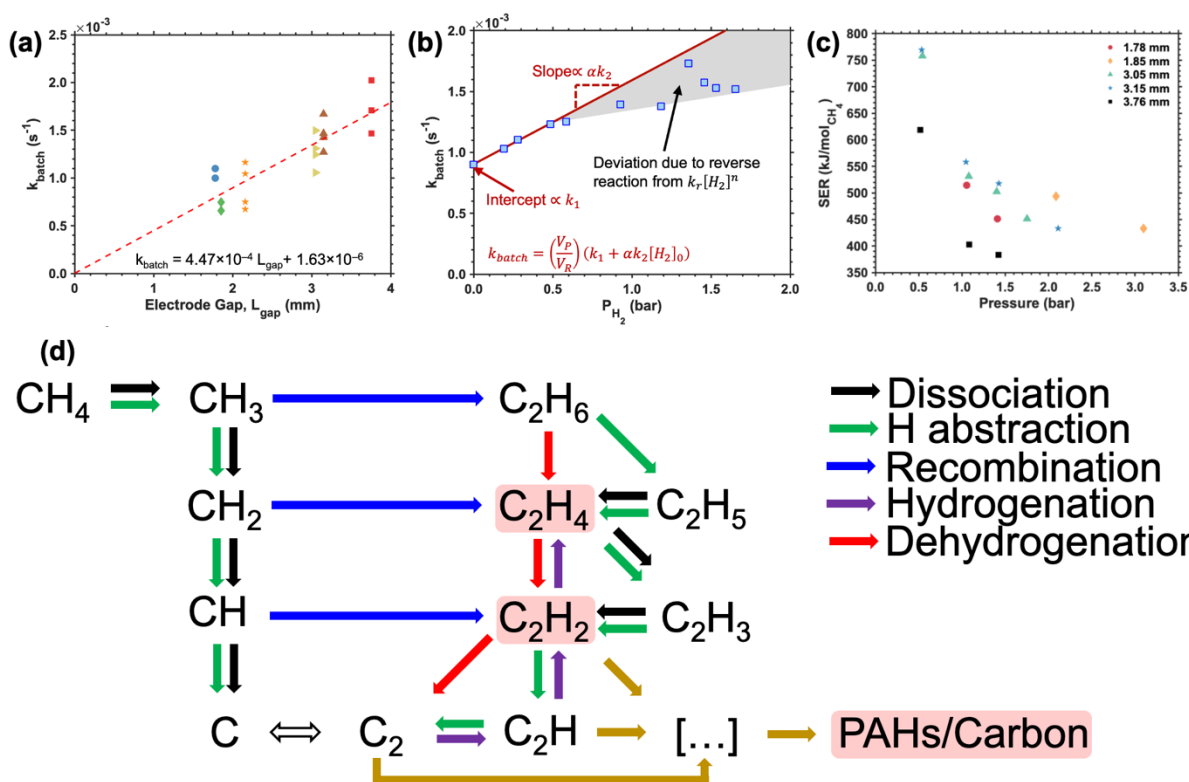


Figure 2. Kinetics of CH₄ dissociation in a low current AC arc discharge. a) The measured rate constants of CH₄ dissociation increase with electrode gap. b) Dilution of the mixture with H₂ increases the dissociation rate of CH₄, which is attributed to the contribution of H abstraction reactions. c) The specific energy required (SER) to dissociate CH₄ decreases with increase in operating pressure. d) Summary of reaction pathways of CH₄ dissociation in a low current AC arc discharge. Major products formed are highlighted in red. PAHs denotes polycyclic aromatic hydrocarbons.