Abstract Submitted
for the GEC18 Meeting of
The American Physical Society

A Spectroscopic Study of Discharge Species Produced in a Packed Bed Dielectric Barrier Discharge Reactor[1] KENNETH ENGELING, JULIUSZ KRUSZELNICKI, MARK KUSHNER, JOHN FOSTER, Univ of Michigan - Ann Arbor — Previous studies have shown that plasma formation and propagation in packed bed appear to occur in cyclic tandem as microdischarges followed by surface ionization waves and restrikes. Because the electron energy distribution can differ depending on the nature of the discharge, excited species and radicals formed within each discharge type may differ considerably. This effort utilizes emission spectroscopy to assess species production from neutral and ionized states of N_2 as well as total emission intensity, thereby providing estimates of electron temperatures and electron density. Combined with results from modeling of the PBR with a plasma-hydrodynamic simulations simulation, scaling laws will be discussed for methods to optimize PBRs for chemical selectivity. This work is expected to yield a great deal of insight into the plasma-induced chemistry prevailing inside of packed bed reactors.

[1]Work supported by US DOE Office of Fusion Energy Science and the National Science Foundation.

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Date submitted: 21 Jun 2018 Electronic form version 1.4