Abstract Submitted
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A novel approach for depyrogenation using a dielectric barrier discharge plasma system.[1] NAMAN BHATT, DUNCAN TROSAN, North Carolina State University, JUSTIN BRIER-JONES , Loma Linda University, CADE BRINKLEY, North Carolina State University, JANN SMALLWOOD, WOLFF KIRSCH, Loma Linda University, KATHARINA STAPELMANN, STEVEN SHANNON, North Carolina State University — Endotoxins in pharmaceutical material have detrimental effects on patient well-being and can limit a material's viability for internal medicine applications. A low cost method to reduce endotoxin levels through plasma assisted depyrogenation is presented. Although plasma based depyrogenation has been demonstrated previously, the mechanisms that drive depyrogenation and development of a cost effective system for this process are in the preliminary stages. A methodology to better understand mechanisms and identify design rules for plasma assisted depyrogenation is presented. A dielectric barrier discharge is built to perform depyrogenation in a sealed environment. Experiments are performed with plasmas of different gases and nitrogen bearing gases are shown to be the most effective for endotoxin reduction. Material modification due to plasma exposure is measured using FTIR and Raman spectroscopy. Preliminary results are presented to show the reduction of endotoxin units as a function of plasma exposure time. Current efforts are to identify the fundamental mechanisms in the plasma that enables the endotoxin reduction and application of depyrogenation processes to complex material forms including micronized powders.

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