

Abstract Submitted
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Atmospheric Pressure Plasmas: A Low-cost Alternative for Depyrogenation of Pharmaceutical Material Used in Internal Medicine¹ NAMAN BHATT, DUNCAN TROSAN, North Carolina State University, JUSTIN BRIER-JONES, Karamedica, Inc., CADE BRINKLEY, JOSHUA PECORARO, North Carolina State University, ANDREW CROFTON, WOLFF KIRSCH, Karamedica, Inc., KATHARINA STAPELMANN, STEVEN SHANNON, North Carolina State University — Endotoxins are a pyrogen class that are relatively stable and difficult to neutralize. Pyrogens have detrimental effects in pharmaceutical material, impact patient well-being, and can limit a material's viability for internal medicine applications. Chitosan is a naturally formed polymer that has many medical applications, but also a high affinity for endotoxin attachment as well as limitations with regard to high temperature degradation that make traditional depyrogenation methods ineffective. Plasma depyrogenation can be an alternative method to efficiently inactivate pyrogens without degrading the chitosan polymer. Plasma-based depyrogenation has been demonstrated previously, but the mechanisms that drive depyrogenation and development of a cost-effective system are in the preliminary stages. A dielectric barrier discharge is built to perform depyrogenation in a sealed environment. Experiments are performed with nitrogen-helium and nitrogen-oxygen mixtures. Preliminary results show the reduction of endotoxin units in chitosan powder. Limulus Amebocyte Lysate (LAL) assay was used for quantification of endotoxin units. Material modification due to plasma exposure is presented using FTIR spectroscopy. -/a

¹National Institutes of Health (NIH), Karamedica, Inc.

Naman Bhatt
North Carolina State University

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