Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

**Investigation of Sterilization Mechanism for *Geobacillus stearothermophilus* Spores with Plasma-Excited Neutral Gas** KEI MATSUI, NORIAKI IKENAGA, NORIYUKI SAKUDO, Kanazawa Institute of Technology — We investigate the mechanism of the sterilization with plasma-excited neutral gas that uniformly sterilizes both the space and inner wall of the reactor chamber at atmospheric pressure. Only reactive neutral species such as plasma-excited gas molecules and radicals are separated from the plasma and sent to the reactor chamber for chemical sterilization. The plasma source gas uses humidified mixture of nitrogen and oxygen. *Geobacillus stearothermophilus* spores and tyrosine which is amino acid are treated by the plasma-excited neutral gas. Shape change of the treated spore is observed by SEM, and chemical modification of the treated tyrosine is analyzed by HPLC. As a result, the surface of the treated spore shows depression. Hydroxylation and nitration of tyrosine are shown after the treatment. For these reasons, we believe that the sterilization with plasma-excited neutral gas results from the deformation of spore structure due to the chemical modification of amino acid.

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Date submitted: 16 Jun 2015 Electronic form version 1.4