

Abstract Submitted
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UV Emission from Poly-Phase Nitric-Oxide Discharge/Plasma Confined by Multi-Pole Magnetic Field and Its Application KAZUNORI MATSUMOTO, Toyama Prefectural University, HIDEFUMI UCHIYAMA, Tateyama Machine Co., LTD., HIROFUMI NINOMIYA, MRC Polysaccharide Co., LTD., SELJI ODA, Cosel Co., LTD., NOBUYUKI NOJIMA, Tateyama Machine Co., LTD. — We have investigated experimentally an effect of a multi-pole magnetic field on UV-emission from molecular gases excited by a poly-phase ac discharge/plasma. It was found that when a nitric oxide gas NO mixed with a nitrogen molecular gas N₂ was used, an intense ultra-violet (UV) irradiation ranging from 200nm to 300nm was emitted from magnetically confined plasma-regions. Maximum UV emission was observed around 10% concentration ratio of NO to N₂. The relation between UV emission characteristics and plasma parameters was studied by using a plane molybdenum probe. As a ratio of NO increased, electron density and temperature decreased. It seems that NO molecules dissipate plasma energy in order to emit UV lights. We have also applied this UV emitter to sterilizing powdered polysaccharides. This UV has shown a similar sterilization performance with the conventional low-pressure mercury UV lamp. This UV emitter is a candidate of a mercury free UV lamp that is applicable for various industrial processing such as a UV cure and a UV cleaning.

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