

Abstract Submitted
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Characteristics of 2-heptanone decomposition using nanosecond pulsed discharge plasma YUKI NAKASE, YUICHI FUKUCHI, DOUYAN WANG, TAKAO NAMIHIRA, HIDENORI AKIYAMA, Kumamoto University, KUMAMOTO UNIVERSITY COLLABORATION — Volatile organic compounds (VOC) evaporate at room temperature. VOCs typically consist of toluene, benzene and ethyl acetate, which are used in cosmetics, dry cleaning products and paints. Exposure to elevated levels of VOCs may cause headaches, dizziness and irritation to the eyes, nose, and throat; they may also cause environmental problems such as air pollution, acid rain and photochemical smog. As such, they require prompt removal. Nanosecond pulsed discharge is a kind of non-thermal plasma consisting of a streamer discharge. Several advantages of nanosecond pulsed discharge plasma have been demonstrated by studies of our research group, including low heat loss, highly energetic electron generation, and the production of highly active radicals. These advantages have shown ns pulsed discharge plasma capable of higher energy efficiency for processes, such as air purification, wastewater treatment and ozone generation. In this research, nanosecond pulsed discharge plasma was employed to treat 2-heptanone, which is a volatile organic compound type and presents several harmful effects. Characteristics of treatment dependent on applied voltage, gas flow rate and input energy density were investigated. Furthermore, byproducts generated by treatment were also investigated.

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