

Abstract Submitted  
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**Production of electrical discharges in acoustic cavitation bubbles**

K. SASAKI, Hokkaido University, N. TAKADA, Y. HAYASHI, M. GOTO, Nagoya University — We produced electrical discharges in acoustic cavitation bubbles with the intension of enhancing the reactivity of sonochemical processes. Acoustic cavitation bubbles were generated in a rectangular vessel which was filled with water by applying an ultrasonic power at a frequency of 27 kHz. The efficient generation of cavitation bubbles was possible with the help of a punching metal plate<sup>1</sup>. Glowlike discharges were observed in cavitation bubbles which were attached on the bottom surface of the cylindrical high-voltage electrode. Bright optical emission was observed in the expanding period of cavitation bubbles, while we also observed electrical discharges even in the shrinking phase. The discharge was possible until 3.7  $\mu$ s before the collapse of cavitation bubbles. If lifetimes longer than 3.7  $\mu$ s are expected for discharge-produced reactive species, the species composition inside the collapsed cavitation bubbles with the discharge may be different from that without the discharge. The discharge in the cavitation bubbles may be helpful to enhance the reactivity of sonochemistry processes.

<sup>1</sup>Y. Iwata, N. Takada, and K. Sasaki, Appl. Phys. Express **6**, 127301 (2013).

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