

Abstract Submitted  
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**Conversion of high-pressure carbon dioxide by laser-induced plasma** TAKU GOTO, HIROTAKA SUZUKI, MASATO KOIZUMI, TSUYOHITO ITO, Osaka University — In the conversion process of  $\text{CO}_2 \rightarrow \text{CO} + 1/2 \text{O}_2$  by means of plasma, an atomic oxygen is often observed as the intermediate state. As the following reaction forming  $1/2 \text{O}_2$  from O is exothermic, unless the energy is reused, the existence of O atoms results in a lower conversion efficiency of the process. Thus, we are trying to find a pathway which forms  $1/2 \text{O}_2$  directly, by contribution of the high pressure, which hopefully boosts the conversion efficiency. In this study, we produce plasma by nanosecond-pulsed laser focused on various metallic targets (Sn, Zn and Cu) in pressurized  $\text{CO}_2$  environments. The results indicate that the energy conversion efficiency depends on the pressure. In addition, applying a target results in a higher energy conversion efficiency than that without targets, and the efficiency depends on the target materials. We currently believe that the target materials modify the initial density of plasma and the pressure controls the following plasma dynamics. The details will be presented at the conference.

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