

## IDENTIFICATION OF THE $^3\Sigma_u^-$ AND $^3\Pi_u$ RYDBERG STATES OF $O_2$ BY DETECTING $O(^1D)$

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The excited states of  $O_2$  in 100-135 nm region consists of many Rydberg states which are still not well understood. We have investigated the excited states of  $O_2$  dissociated into  $O(^1D)+O(^3P)$ . The experiment was conducted in a gas cell using the synchrotron radiation as the excitation source.  $O(^1D)$  was detected by the infrared emission at 762 nm produced from the  $O_2(b^1\Sigma_g^+)$  formed by the energy transfer process from  $O(^1D)$  to  $O_2$ . A spectrum between 105 and 130 nm for producing  $O(^1D)$  was obtained, which revealed the vibrational progression of the  $n^3\Sigma_u^-$  states for  $n=2$  to 4. By comparing with the absorption spectrum, the  $^3\Pi_u$  state correlated with  $O(^3P)+O(^3P)$  was also obtained.