

Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

Line profile and translational temperature of Pb and metastable He atoms at middle pressures in micro hollow cathode discharge¹ MARI INOUE, Wakayama University, TAKAYUKI OHTA, MASAFUMI ITO, Meijo University, MASARU HORI, Nagoya University — Hollow cathode discharges have been studied as light sources. Conventional hollow cathode discharges have been operated at low pressure, while micro hollow cathode discharges at near atmospheric pressure. At the middle pressures below 40 kPa, the emission of metallic atoms is observed due to sputtering. Moreover, the line profile of atom shifts from a Gaussian to Voigt profile as increasing pressure. In this study, the behaviors of Pb and metastable He atoms in the micro hollow cathode discharge at pressures of the order of kPa have been investigated by diode laser absorption spectroscopy. The pressure broadening effect for absorption line-profile was overlapped to Doppler profile and was estimated to be 0.26 MHz/Pa for metastable He atoms in the range from 5 to 10 kPa. The translational temperature decreased from 830 to 410 K with increasing the pressure. For Pb atoms, the temperature decreased from 820 to 610 K with increasing He pressure from 4.9 to 7.4 kPa. The pressure broadening effect for Pb atom has been estimated to be 0.22 MHz/Pa.

¹This work was partly supported by the Knowledge Cluster Initiative (the Second Stage) -Tokai Region Nanotechnology Manufacturing Cluster -from MEXT of Japan and a Grant-in-Aid for Young Scientists (B) (No. 22760561) from JSPS in Japan.

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Date submitted: 18 Jun 2012

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