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Study on the role of active radicals on plasma sterilization inside small diameter flexible polymeric tubes[1] HIROTO MSTSUURA, TAKATOMO FUJIYAMA, YASUKI OKUNO, MASAKAZU FURUTA, SHUICHI OKUDA, Osaka Prefecture University, YUICHIRO TAKEMURA, Kinki University
— Recently, atmospheric pressure discharge plasma has gathered attention in various fields. Among them, plasma sterilization with many types of plasma source has studied for decades and its mechanism is still an open question. If active radicals produced in plasma has main contribution of killing bacterias, direct contact of the so-called plasma flame might not be necessary. To confirm this, sterilization inside small diameter flexible polymeric tubes is studied in present work. DBD type plasma jet is produce by flowing helium gas in a glass tube. A long polymeric tube is connected and plasma jet is introduced into it. Plasma flame length depends on helium gas flow rate, but limited to about 10 cm in our experimental condition. E.colis set at the exit plasma source is easily killed during 10 min irradiation. At the tube end (about 20 cm away from plasma source exit), sterilization is possible with 30 min operation. This result shows that active radical is produced with helium plasma and mist contained in sample, and it can be transferred more than 20 cm during it life time. More plasma diagnostic data will also be shown at the conference.

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