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NO generation using surface dielectric barrier discharges with gas heating.[1] SEUNGIL PARK, CHANGHO YI, SUNG-YOUNG YOON, SEUNGMIN RYU, SEONG BONG KIM, National Fusion Research Institute, PLASMA TECHNOLOGY RESEARCH CENTER TEAM — This paper represents a nitric oxide (NO) generation using surface dielectric barrier discharges (SDBDs) at atmospheric pressure (AP) with gas heating. Nitric oxide is one of the dominant long-lived reactive species generated by the plasma, and is identified to play a key role in sterilization and inhibition of respiration in agricultural products. By adjusting the gas temperature, the plasma chemistry can be changed from an ozone (O_3)-dominated mode to nitrogen oxides (NO_x)-dominated mode. The ambient gas was heated using an IR lamp heater installed on the electrode of SDBDs, and clean dry air (CDA) was used to minimized the influence of the humidity at atmospheric pressure. The concept of NO generation using SDBDs with gas heating was verified by measuring the O_3 and NO_x concentrations with gas analyzers, and the mode transition due to temperature rise of ambient gas was observed with a constant power at atmospheric pressure. This plasma source is characterized to generate only NO by controlling the gas heating temperature and time interval between heating and plasma discharge. The measured data was compared with the calculated data using global model.

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