

Mechanism and comparison of the needle-type non-thermal direct and indirect atmospheric pressure plasma jets on the degradation of dyes

Pankaj Attri^{a,b*#}, Maksudbek Yusupov^{c#}, Ji Hoon Park^{a#}, Lakshmi Prasanna Lingamdinne^d, Janardhan Reddy Koduru^e, Masaharu Shiratani^b, Eun Ha Choi^{a*}, and Annemie Bogaerts^{c*}

^aPlasma Bioscience Research Center / Department of Electrical and Biological Physics, Kwangwoon University, Seoul 139-701, Korea.

^bGraduate School of Information Science and Electrical Engineering, Kyushu University

Fukuoka 819-0395, Japan

^cResearch Group PLASMANT, Department of Chemistry, University of Antwerp, Universiteitsplein 1, B-2610 Antwerp, Belgium

^dDepartment of Environmental Engineering, Kwangwoon University, Seoul, 139-701, Republic of Korea

^eGraduate School of Environmental Studies, Kwangwoon University, Seoul, 139-701, Republic of Korea

Supporting file Figure captions

Fig. S1: Waveforms of current and voltage for both ID-APPJ and D-APPJ

Fig. S2: Degradation percentages calculated by HPLC for (a) MB; (b) MO and (c) CR, after treatment with ID-APPJ and D-APPJ for 20 min and 30 min.

Fig. S3: HPLC graphs for MB; (a) control, (b) and (c) after ID-APPJ treatment for 20 min and 30 min, respectively, and (d) and (e) after D-APPJ treatment for 20 min and 30 min, respectively.

Fig. S4: HPLC graphs for MO; (a) control, (b) and (c) after ID-APPJ treatment for 20 min and 30 min, respectively, and (d) and (e) after D-APPJ treatment for 20 min and 30 min, respectively.

Fig. S5: HPLC graphs for CR; (a) control, (b) and (c) after ID-APPJ treatment for 20 min and 30 min, respectively, and (d) and (e) after D-APPJ treatment for 20 min and 30 min, respectively.

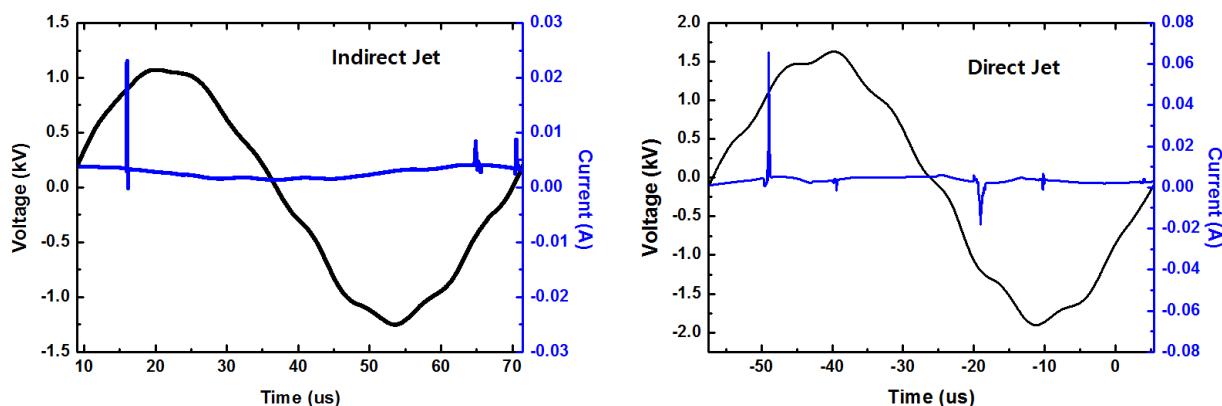


Fig. S1

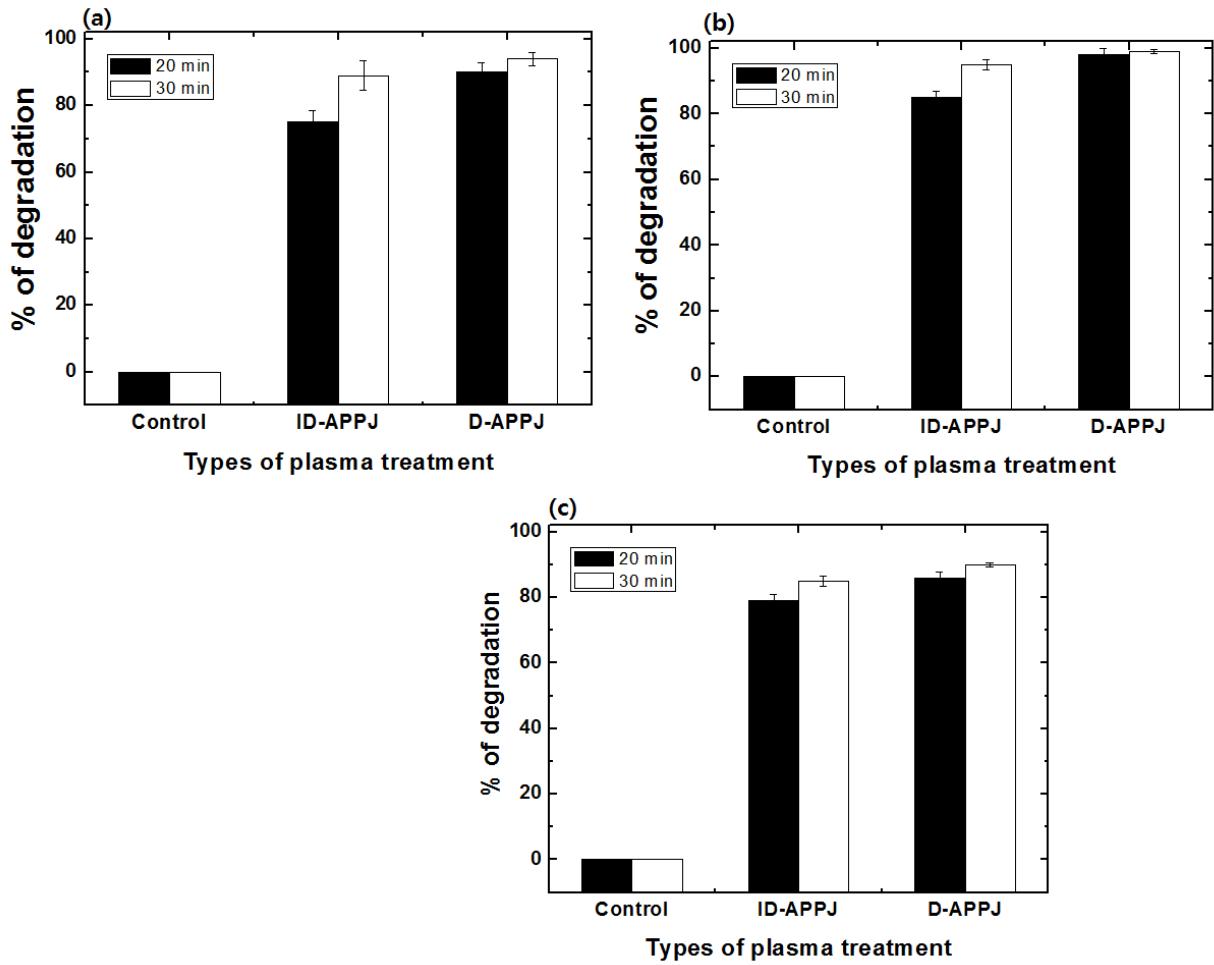


Fig. S2

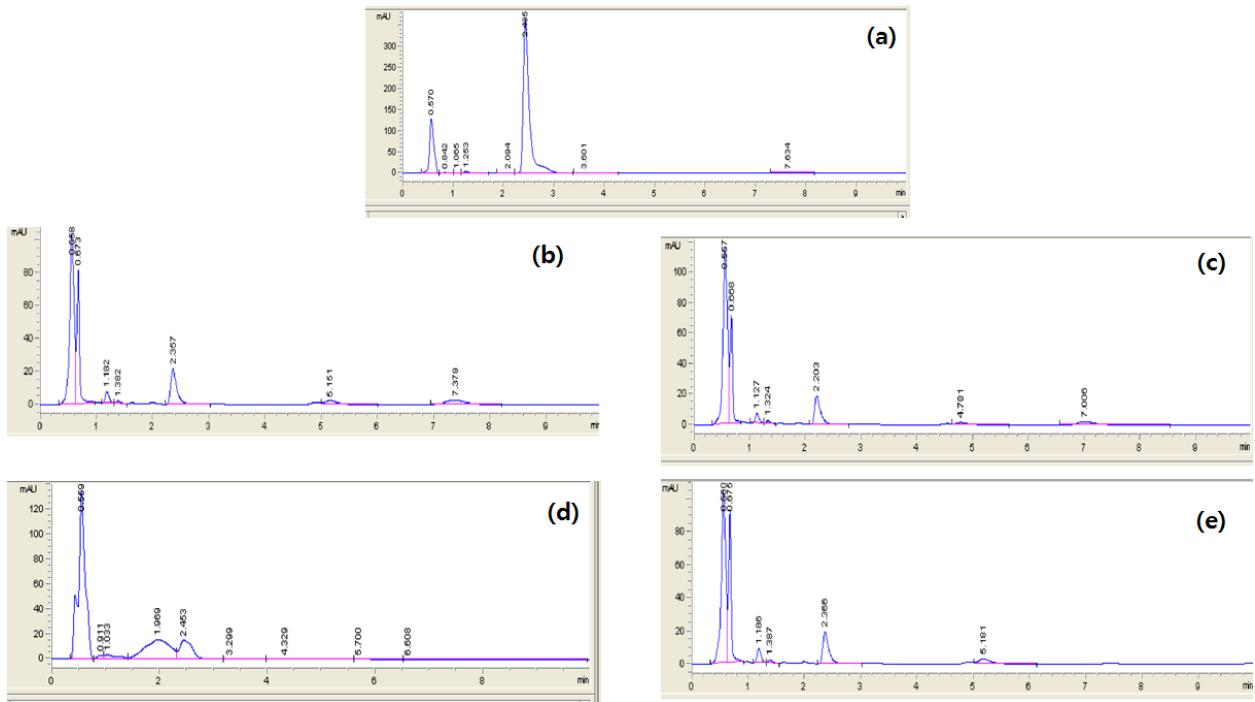


Fig. S3

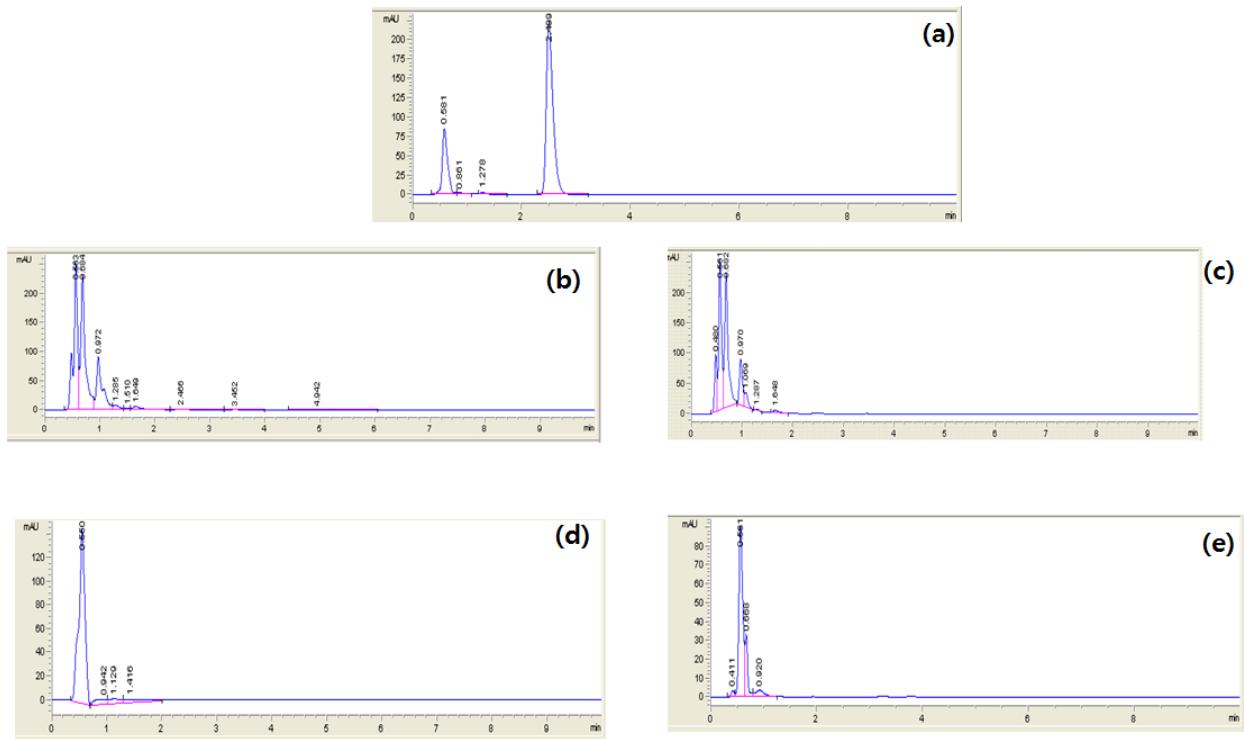


Fig. S4

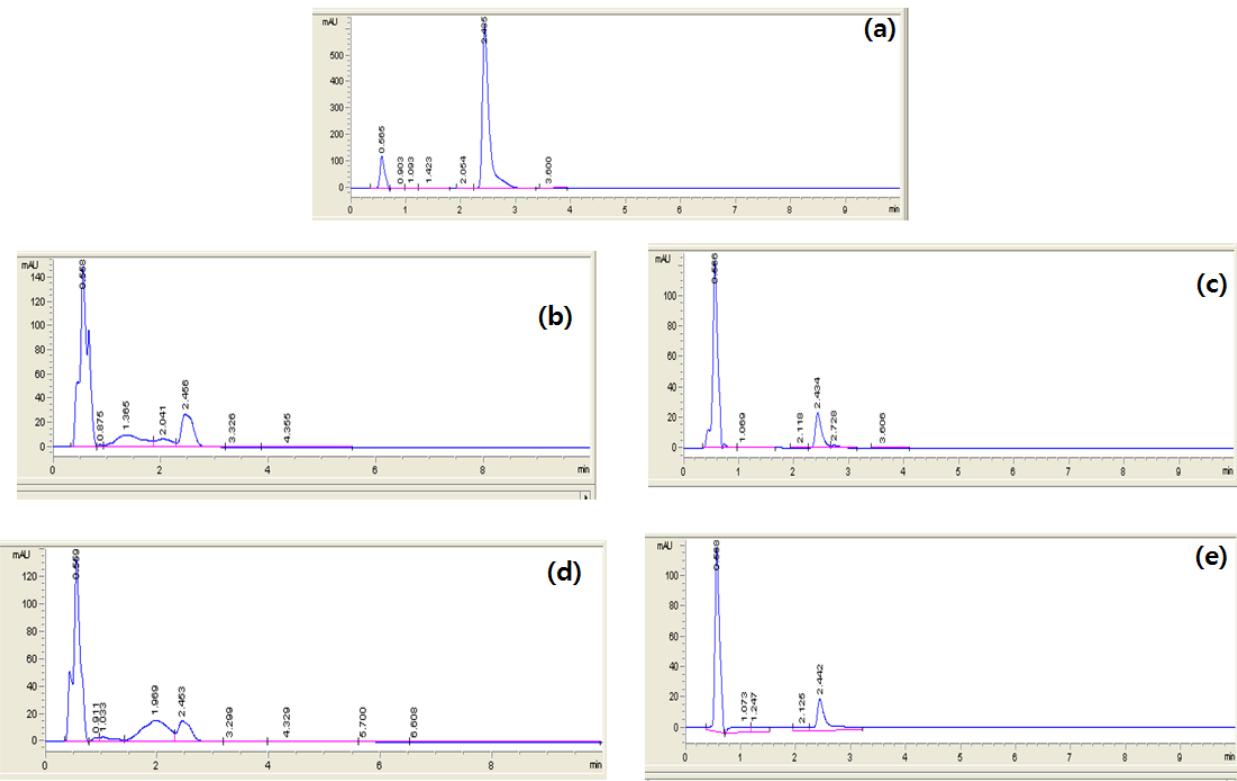


Fig. S5