Electronic Supplementary Material (ESI) for Polymer Chemistry.
This journal is © The Royal Society of Chemistry 2017

Microplasma-assisted rapid, chemical oxidant-free and controllable polymerization of dopamine for surface modification

Zhe Wang, Chao Xu, Yuexiang Lu*, Guoyu Wei, Gang Ye, Taoxiang Sun, Jing Chen*

Institute of Nuclear and New Energy Technology, Collaborative Innovation Center of Advanced Nuclear Energy Technology, Beijing Key Lab of Radioactive Waste Treatment, Tsinghua University, Beijing, People's Republic of China, 100084

*Email: luyuexiang@mail.tsinghua.edu.cn, jingxia@mail.tsinghua.edu.cn

Supplementary Figures and Tables

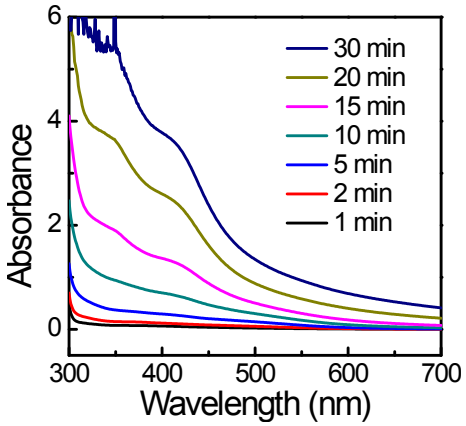

Fig. S1 UV-Vis spectra of PDA treated by microplasma cathode for different time.

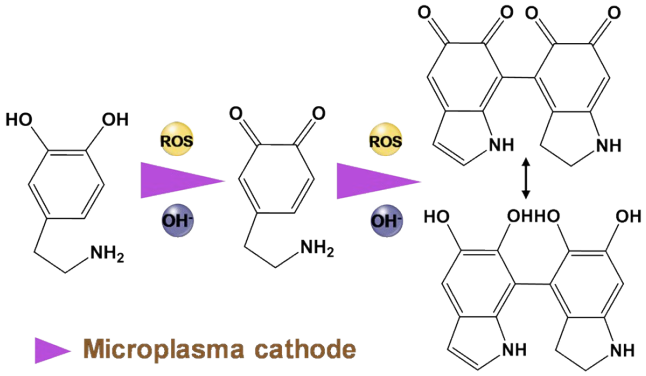

Fig. S2 The possible polymerization mechanism of dopamine induced by microplasma cathode.

Table S1. The pH of dopamine solution after treated by plasma cathode for different time, $pH_{initial}$=5.

Time/min	1	2	5	10	15	20	30
pH	5.80	6.04	6.41	6.67	6.90	7.12	7.24

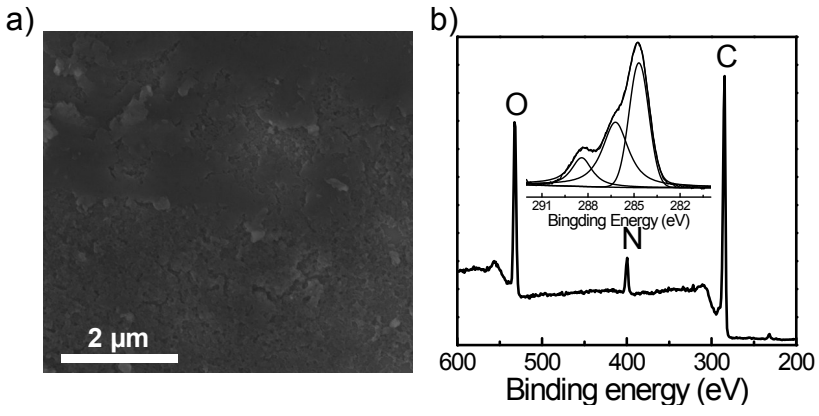

Fig. S3 (a) SEM image and (b) XPS analysis of PDA coated on silicon wafer.

Table S2. XPS analysis (C1s analysis)

	Peak binding energy (eV)	PDA (%)
C-C/C=C	284.7	43.2
C-N	286.2	42.2
C=O	288.4	14.6

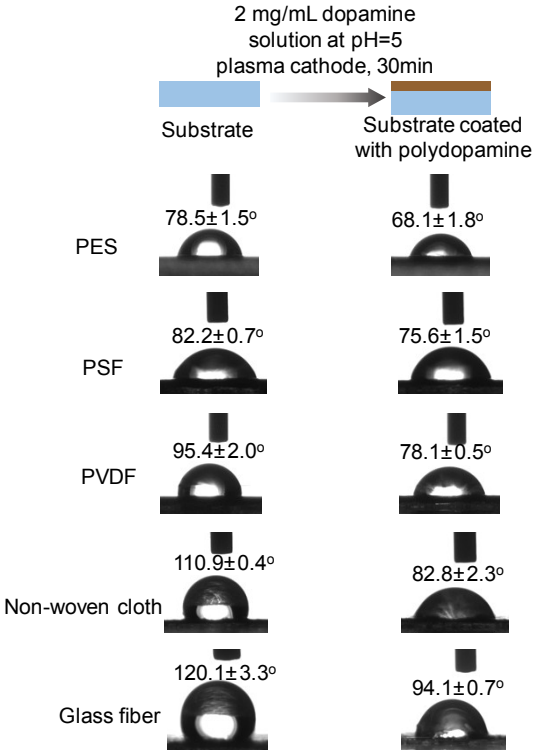

Fig. S4 The water contact angles before and after the deposition of PDA coating on various substrates. PES: polyether sulfone, PSF: polysulfone, PVDF: polyvinylidene fluoride.

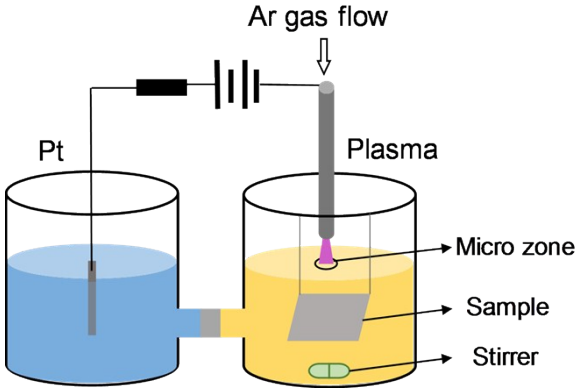

Fig. S5 Scheme of the "H" type reactor in the preparation of PDA with microplasma method.