

Electronic Supplementary Information (ESI)

Single photon ionization time-of-flight mass spectrometry with a windowless RF-discharge lamp
for high temporal resolution monitoring of the initial stage of methanol-to-olefins reaction

QingYun Li^a, Lei Hua^b, Yuanyuan Xie^b, Jichun Jiang^b, Hanwei Li^a, Keyong Hou^b, Di Tian^{*,a},
HaiYang Li^{*,b}

^a College of Instrumentation & Electrical Engineering, Jilin University, Changchun 130061, China

^b Key Laboratory of Separation Science for Analytical Chemistry, Dalian Institute of Chemical
Physics, Chinese Academy of Sciences, Dalian 116023, China

* E-mail: tiandi@jlu.edu.cn. hli@dicp.ac.cn.

Tel: +86-411-84379510.

Fax: +86-411-84379517.

This supporting material includes additional information on the following aspects:

Table S1 Experimental parameters of the time-of-flight mass analyzer

Parameters	Dimension (mm)	Voltage (V)
Extraction region	10	± 400 V, 40 kHz
Acceleration region	44.5	+2498
Field free region	348.5	+2498
Reflector stage one	83	+166
Reflector stage two	28	+426
MCP ionization detector	Φ 36	-4300

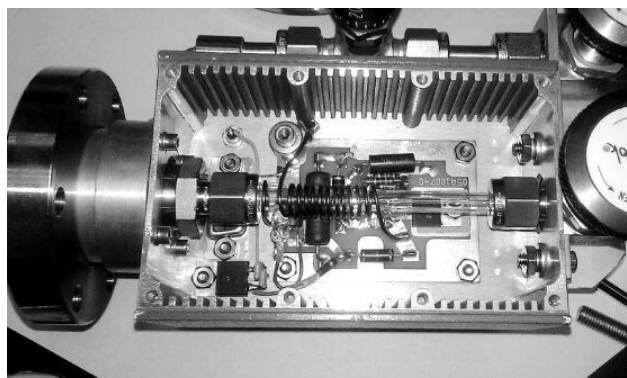


Fig. S1 Photo of the inner structure of the windowless RF-discharge lamp

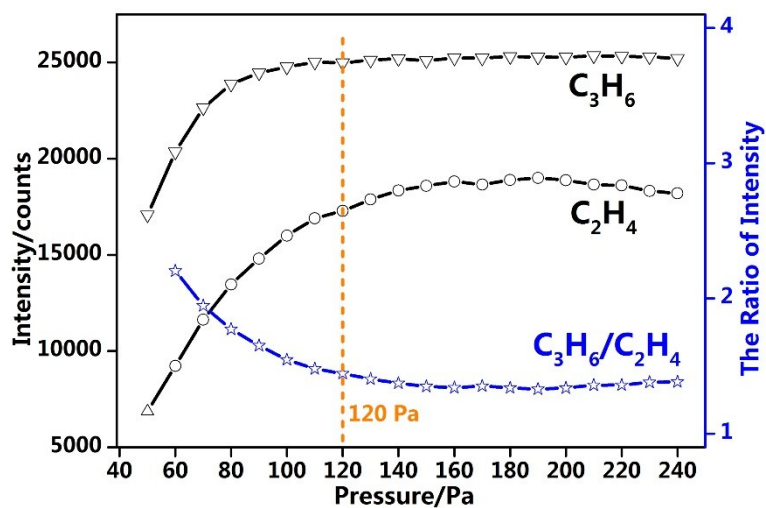


Fig. S2 The signal intensity of molecular ions and the intensity ratio of propylene to ethylene as a function of the ion source pressure.

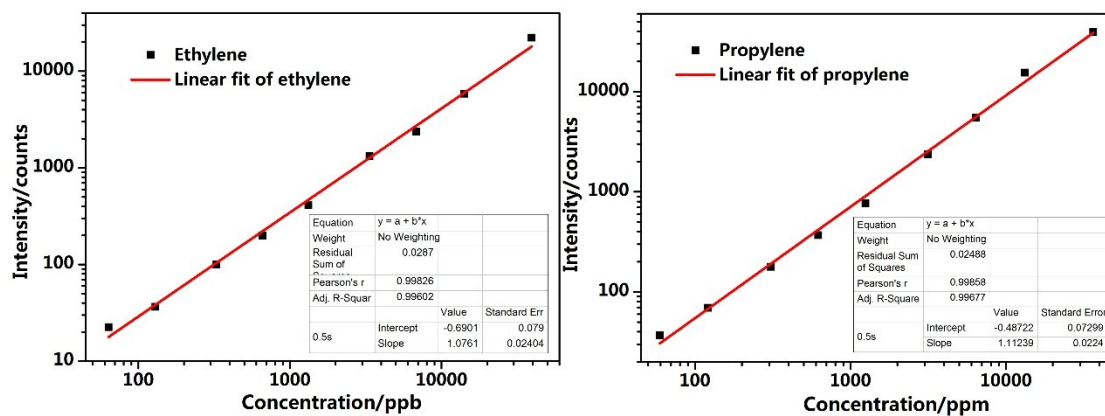


Fig. S3 Linear calibration curves for ethylene, propylene in the concentration range from 60 to 40000 ppbv.