Supplementary Material (ESI) for Green Chemistry

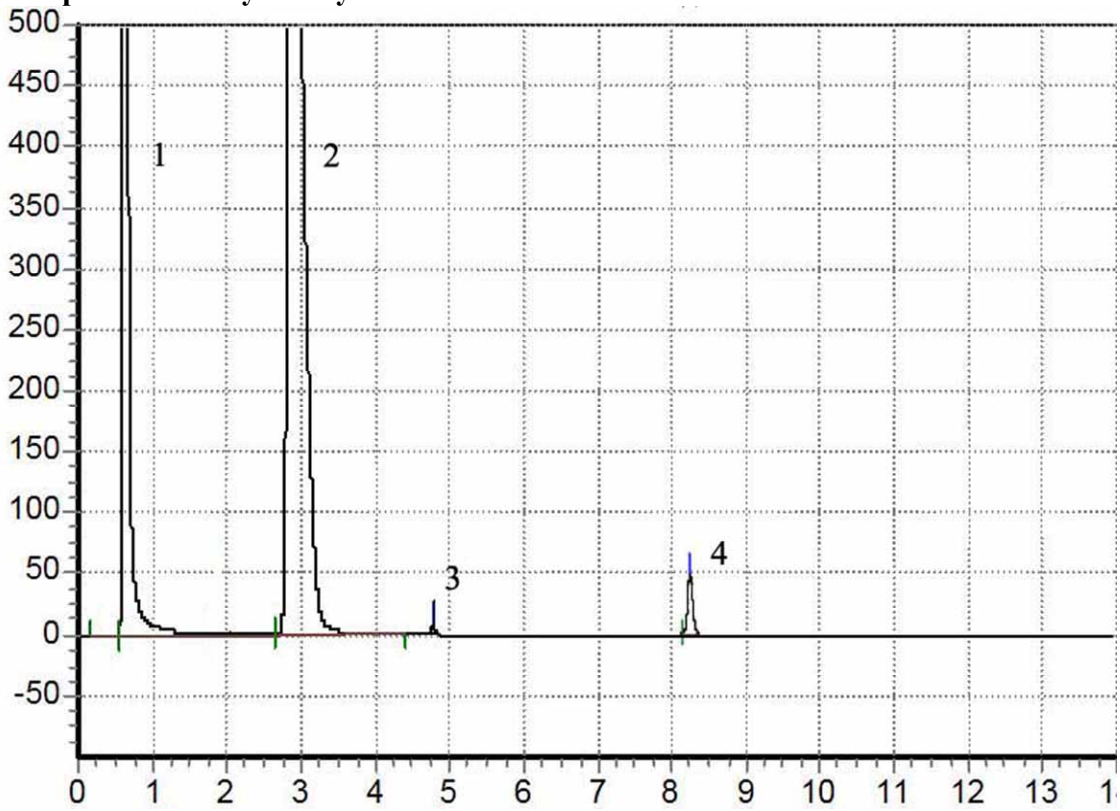
Supporting Information for

Gas-liquid Acetylene Hydrochlorination under Nonmercuric Catalysis Using Ionic Liquids as Reaction Media

Gang Qin[a,b], Yuhan Song[a], Rui Jin[a], Jun Shi[a], Zhiyong Yu[c], Shaokui Cao[a*]

([a]*School of Materials Science and Engineering, Zhengzhou University, Zhengzhou 450052, China;*
E-mail:caoshaokui@zzu.edu.cn
[b]*School of Materials Science and Engineering, Henan Polytechnic University, Jiaozuo 454001, China*
[c]*Beijing Longzida Science and Technology Development Co., Ltd., Beijing 100029, China*)

GC spectra of acetylene hydrochlorination



1: acetylene 2: vinyl chloride monomer 3: 1,1-dichloroethane 4: 1,2-dichloroethane

The byproducts include 1,2-dichloroethane and 1,1-dichloroethane.

[Bmim]Cl, [Bmim]HSO_4, [Bmim]PF_6, [Emim]PF_6, [EPy]Br, [BPy]BF_4 were obtained from Lanzhou Institute of Chemical and Physics, Chinese Academy of Sciences. $CuCl_2$, $HgCl_2$, $SnCl_4$, $MnCl_4$, H_2PtCl_6, and $HAuCl_4$ were purchased from Aldrich, A.R. High-purity C_2H_2 (99.99%) and 3.0N HCl (≥99.9%) were obtained from Praxair, Inc. All these chemicals were used as received.

The glass rotameters were obtained from Shuanghuan Thermo-Technical Instrument Co., Ltd., China, which were used to control the space velocity and the ratio of acetylene and hydrogen chloride.

The outlet gas compsition was measured by gas chromatography (GC, Agilent 1490) with a stainless-steel column (2m × 3mm) packed with GDX202 (60 to 80 mesh). The GC measurement was operated with N_2 as carrier gas (40ml/min), and temperatures of injection port, column and flame ionization detector were 120, 100 and 140 ^{o}C, respectively. An external standard technique was used to determine acetylene conversion and VCM selectivity with an area unitary method:

$$\text{Acetylene conversion} = (V_{total} - V_{acetylene})/ V_{total}$$

$$\text{VCM selectivity} = V_{VCM}/(V_{total} - V_{acetylene})$$