

Supporting Information

Poly(styrene)-supported *N*-heterocyclic carbene coordinated iron chloride as a catalyst for delayed polyurethane polymerization

Hyeon-Jun Noh^{1,†}, T. Sadhasivam^{1,2,†}, Do-Sung Jung¹, Keundeuk Lee⁴, Mingu Han⁴, Ju-Young Kim^{3,*}, and Ho-Young Jung^{1,2,*}

¹*Department of Environment & Energy Engineering, Chonnam National University, 77 Yongbong-ro, Buk-gu, Gwangju 61186, Republic of Korea*

²*Center for Energy Storage System, Chonnam National University, 77 Yongbong-ro, Buk-gu, Gwangju 61186, Republic of Korea*

³*Department of Advanced Materials Engineering, Kangwon National University, Samcheok, Kangwon 245-711, Republic of Korea.*

⁴*4th R&D Institute 2nd Directorate Agency for Defense Development, Yuseoung P.O.Box 35, Daejeon, 34186, Korea*

* Author to whom correspondence should be addressed.

Ho-Young Jung E-mail: jungho@jnu.ac.kr, jungho@chonnam.ac.kr

Ju-Young Kim E-mail: juyoungk@kangwon.ac.kr

† Authors Hyeon-Jun Noh and T. Sadhasivam contributed equally to this work and should be considered as co-first authors.

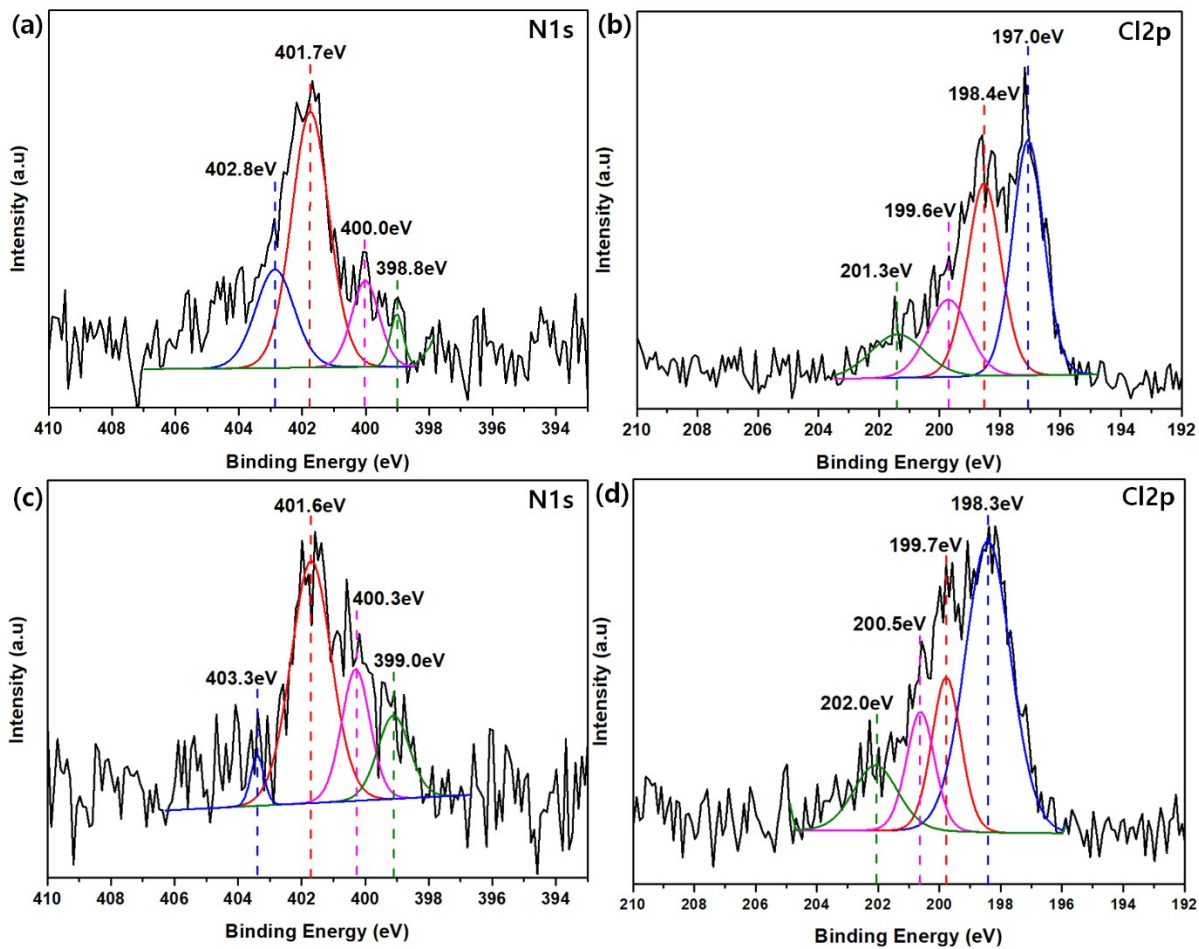


Figure S1. Deconvoluted XPS spectra of (a) N1s and (b) Cl in PS-Im and (a) N1s and (d) Cl in PS-Im-FeCl₃.

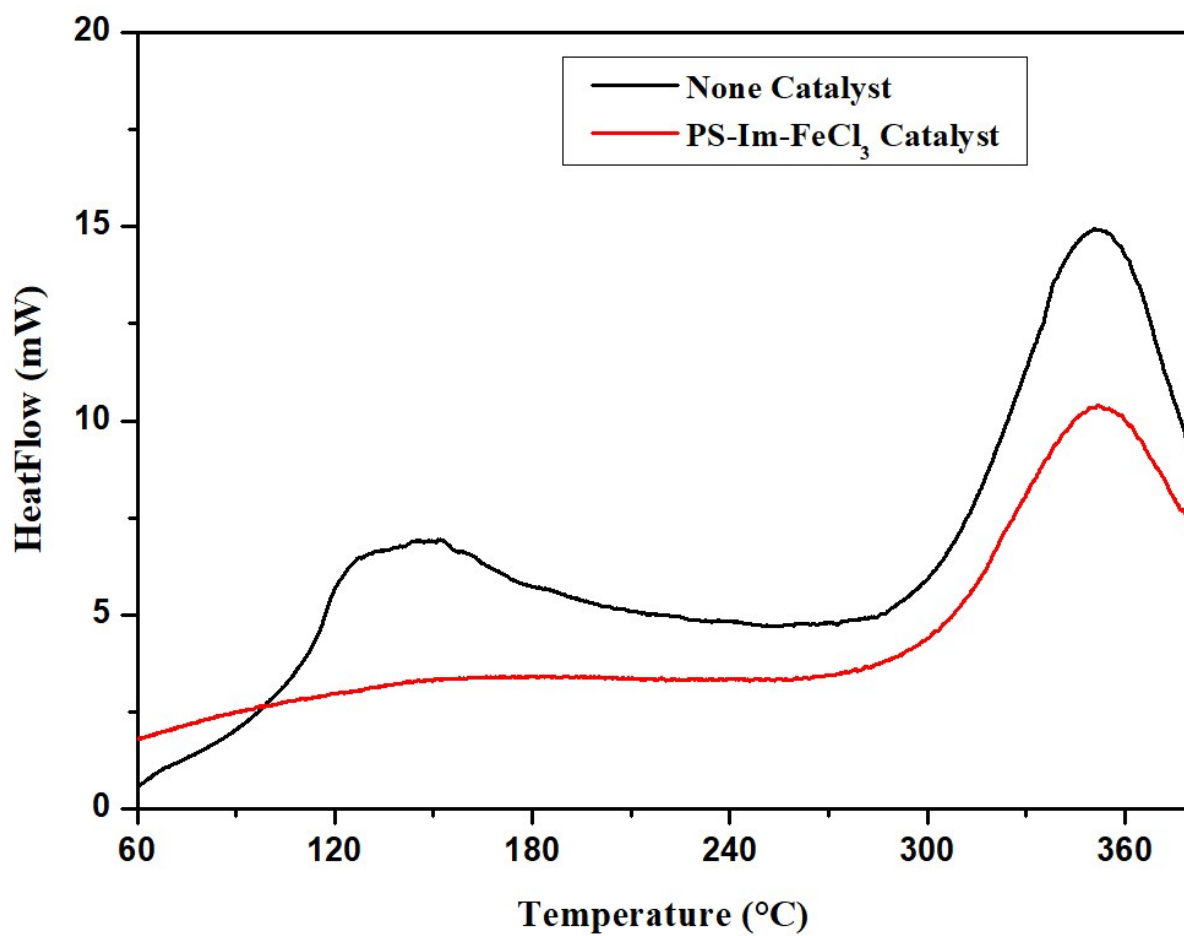


Figure S2. DSC non-isothermal curves with no catalyst and with the PS-Im-FeCl₃ catalyst obtained at a heating rate of 5 °C/min.

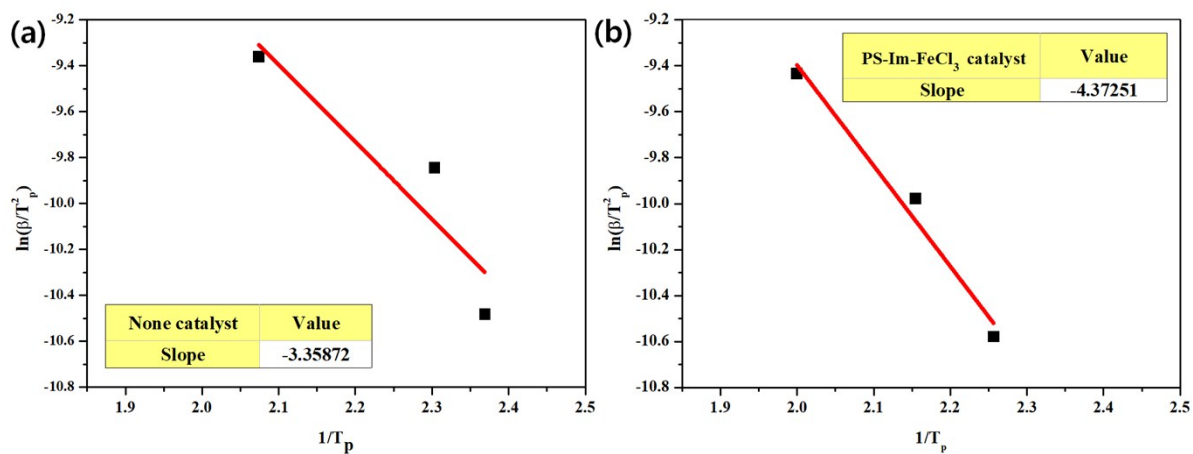


Figure S3. DSC fitting curves for the activation energy of (a) the no-catalyst system and (b) the PS-Im-FeCl₃ catalyst system.

Table S1. Viscosity measurements during PU polymerization with no catalyst and with TPB and PS-Im-FeCl₃ catalysts with respect to time.

Time (h)	Viscosity (cP)		
	No catalyst	TPB catalyst	PS-Im-FeCl ₃ catalyst
1	120	142	158
2	64	157	54
3	75	168	82
4	84	3407	84
5	85	5999	95
6	91	–	102
7	93	–	123
8	98	–	128
9	150	–	285
10	250	–	295
11	684	–	256
12	887	–	281
13	982	–	283
14	1025	–	382
15	2052	–	418
16	3055	–	851
17	3825	–	1205
18	4005	–	1823
19	4825	–	2483
20	5105	–	2853
21	5340	–	3848
23	5999	–	4585
24	–	–	5215
25	–	–	5999