

Supplementary Material

1

2 **Domino synthesis of bio-derived anethole over facile prepared**
3 **hafnium phosphonate frameworks with efficient bifunctional**
4 **acid sites**

5 Long Chen^{¶a}, Yixuan Liu^{¶a}, Heng Zhang^{*a}, Yuncong Li^a, Songdang Zhang^a, Yulin Hu^b,

6 Hu Li^{*a}, Song Yang^{*a}

7 *^aState Key Laboratory Breeding Base of Green Pesticide & Agricultural*
8 *Bioengineering, Key Laboratory of Green Pesticide & Agricultural Bioengineering,*
9 *Ministry of Education, State-Local Joint Laboratory for Comprehensive Utilization of*
10 *Biomass, Center for Research & Development of Fine Chemicals, Guizhou University,*
11 *Guiyang, Guizhou 550025, China*

12 *^bFaculty of Sustainable Design Engineering, University of Prince Edward Island,*
13 *Charlottetown, PE C1A 4P3, Canada*

14

15 [¶]Equal contribution.

16 * Correspondence should be addressed to Heng Zhang: h Zhang23@gzu.edu.cn, Hu Li:

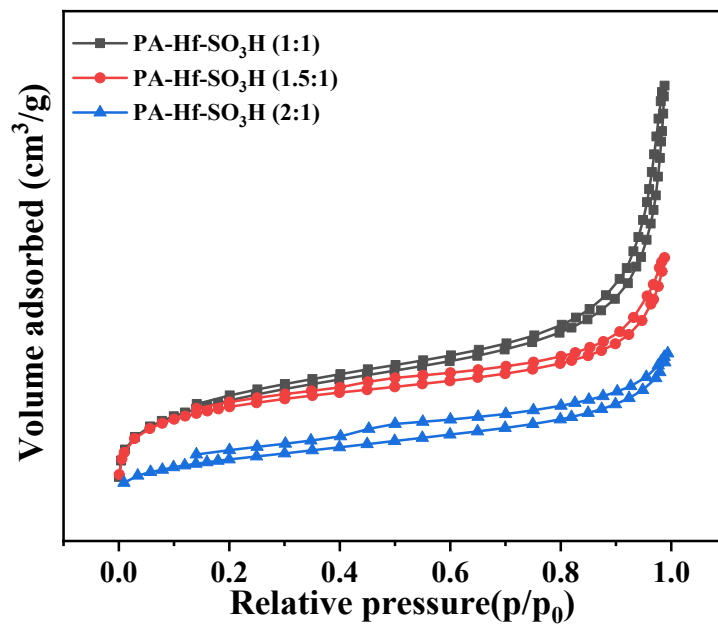
17 hli13@gzu.edu.cn, and Song Yang: jhzx.msm@gmail.com.

18

19 Submission for *Reaction Chemistry & Engineering*

20

December 27, 2022



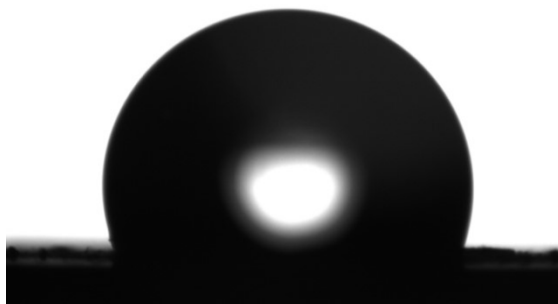
21

22

Fig S1. N₂ adsorption-desorption isotherms of the catalysts with different components.

23

24

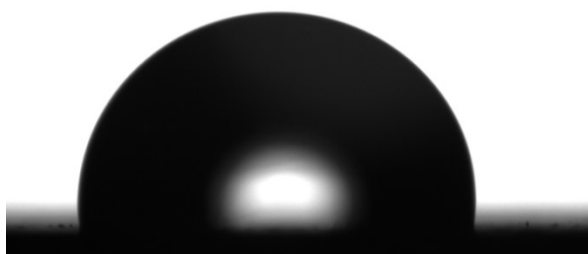


25

26

PA-Hf-SO₃H (2:1) (CA≈110°)

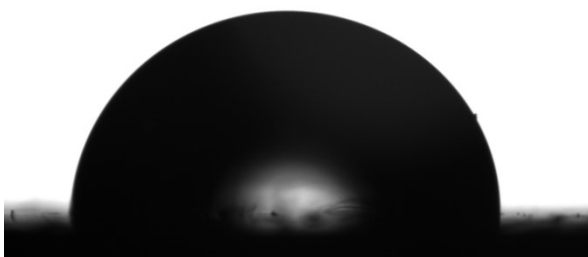
27



28

PA-Hf-SO₃H (1.5:1) (CA≈91°)

29

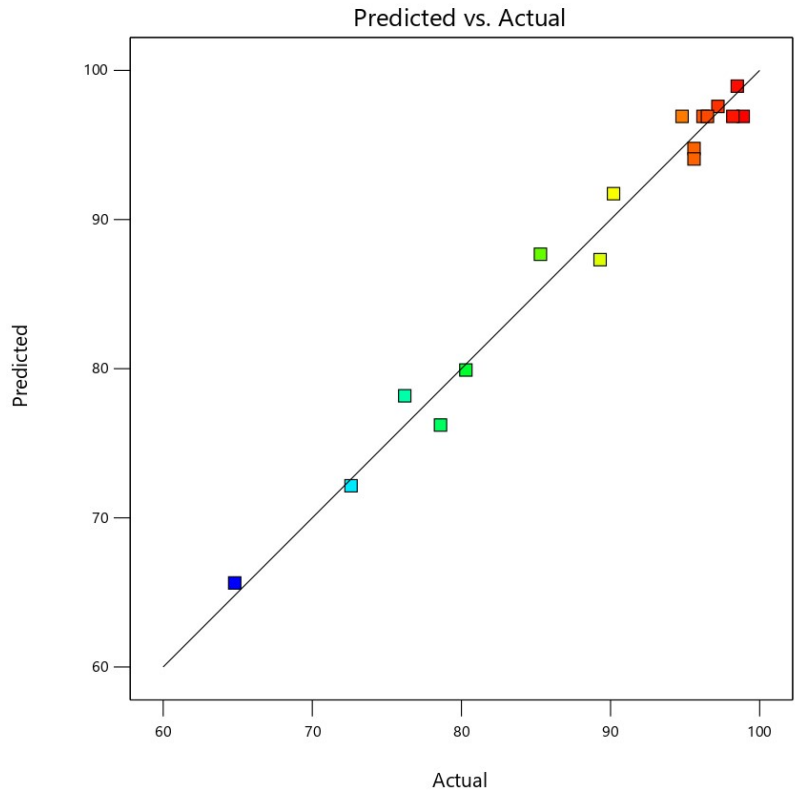


30

PA-Hf-SO₃H (1:1) (CA≈80°)

31

Fig S2. Contact angles of water droplets on the surface of different catalysts.



32

33

Fig S3. The relative parity of the AN yield and predicted value.

34

35 Table S1. The design matrix includes experimental variables (A-C) and AN yield (Response Value).

Run	Temperature (°C)	Time (h)	Catalyst dosage (g)	Yield/%
No.	(A)	(B)	(C)	
1	250	2	0.06	96.8
2	220	1.5	0.06	97.5
3	190	1.5	0.08	76.2
4	220	2	0.04	90.2
5	250	1	0.06	85.3
6	190	1	0.06	72.6
7	220	1.5	0.06	98.3
8	220	1.5	0.06	97.5
9	220	1	0.04	80.3
10	250	1.5	0.08	96.4
11	220	1.5	0.06	96.2
12	220	1	0.08	95.6
13	190	2	0.06	96.2
14	190	1.5	0.04	64.8
15	250	1.5	0.04	89.3
16	220	1.2	0.06	94.8
17	220	2	0.08	97.2