[Supporting Information]

Enhanced recognition of nitrogen-containing organic compound by adjusting acidity of porous organic frameworks base (JUC-Z2)

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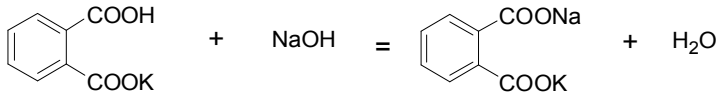
1. Determination of degree of sulfonation

(1) Preparation and calibration of sodium hydroxide solution：



$$C_{NaOH} = \frac{m_{KHC_8H_4O_4} \times 1000}{M_{KHC_8H_4O_4} \times V_{NaOH}} \qquad (M_{KHC_8H_4O_4} = 204.2 g mol^{-1}) \qquad (1)$$

Table S1. Calibration of sodium hydroxide solution Indicator: phenolphthalein

	1	2	3
$m_{KHC_8H_4O_4}$ / g	2.9912	3.1448	2.9888
V_{NaOH} / mL	14.43	15.17	14.40
C_{NaOH} / mol L^{-1}	1.0151	1.0158	1.0164
$\overline{C}_{NaOH}$ / mol L^{-1}		1.0158	

(2) Preparation and calibration of hydrochloric acid solution：

$$C_{HCl} = \frac{C_{NaOH} \times V_{NaOH}}{V_{HCl}} \qquad (2)$$

Table S2. Calibration of hydrochloric acid solution

	1	2	3
V_{NaOH} / mL	15.00	15.00	15.00
V_{HCl} / mL	15.20	15.22	15.21
C_{HCl} / mol L^{-1}	1.0024	1.0011	1.0018
$\overline{C}_{HCl}$ / mol L^{-1}		1.0018	

(3) Determination of degree of sulfonation:

Procedure:

1) Polymer was grinded into powder. 0.1 g of JUC-Z2-SO_3H was taken in a 100 mL flask followed by addition of 20.00 mL sodium hydroxide standard solution.
2) Mixing for 72 h to attain uniformity.
3) Using phenolphthalein as indicator, the determination of degree of sulfonation by acid-base titration.

$$H = \frac{C_1V_1 - C_2V_2}{m} \quad (3)$$

H——degree of sulfonation (mmol/g)

m——the quality of the polymer (g)

C_1——the concentration of sodium hydroxide standard solution (mol/L)

V_1——volume of sodium hydroxide standard solution (0.02 L)

C_2——the concentration of hydrochloric acid standard solution (mol/L)

V_2——volume of Hydrochloric acid standard solution (L)

Table S3. Determination of degree of sulfonation

	1	2	3
m / g	0.1004	0.1010	0.1008
V_{NaOH} / mL	20.00	20.00	20.00
V_{HCl} / mL	19.95	19.98	19.96
H / mmol g^{-1}	3.39	3.08	3.27
$\overline{H}$ / mmol g^{-1}		3.21	

2. Binding of host solid JUC-Z2-SO_3H with ethylenediamine guest in different solvent.

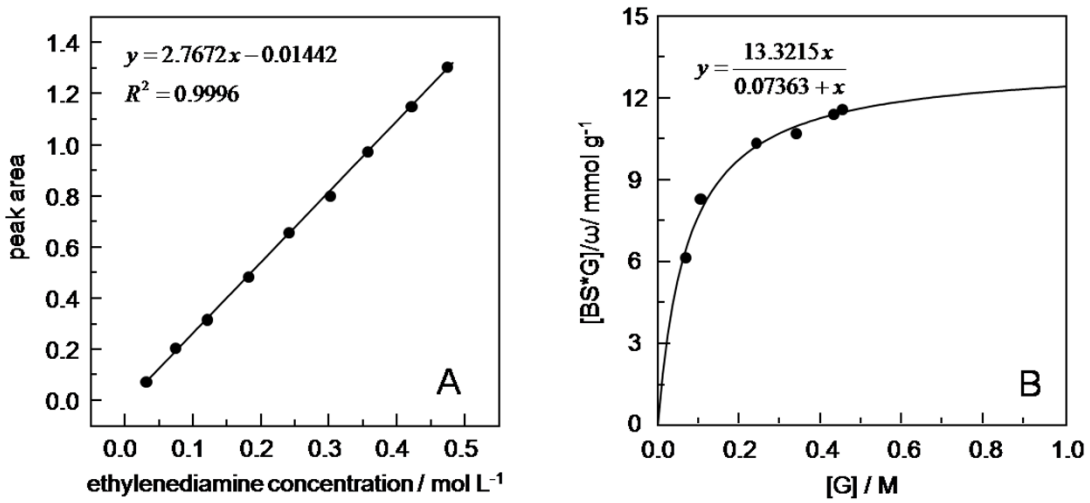


Figure S1. Linear curve of GC at various ethylenediamine concentration in carbon tetrachloride solvent (CCl_4) (A), Binding of host solid JUC-Z2-SO_3H with ethylenediamine guest (B).

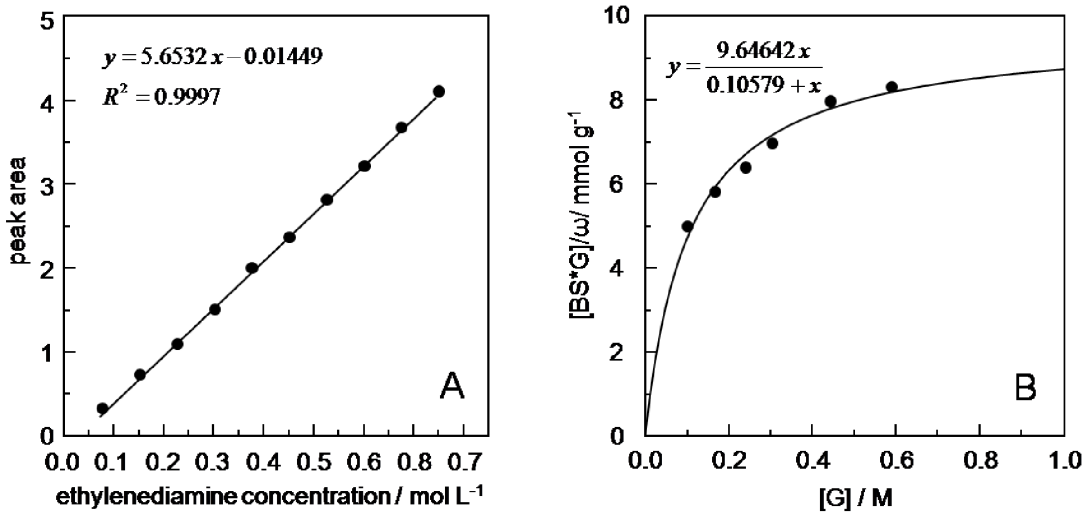


Figure S2. Linear curve of GC at various ethylenediamine concentration in ethanol (A), Binding of host solid JUC-Z2-SO_3H with ethylenediamine guest (B).

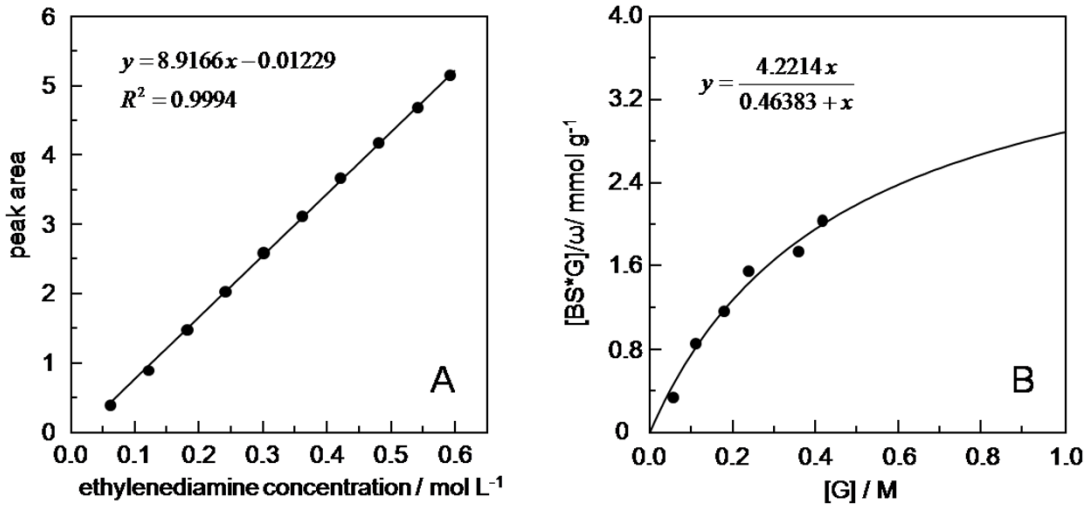


Figure S3. Linear curve of GC at various ethylenediamine concentration in methanol (A), Binding of host solid JUC-Z2-SO_3H with ethylenediamine guest (B).

3. Binding of host solid JUC-Z2-SO_3H with n-butylamine guest in different solvent.

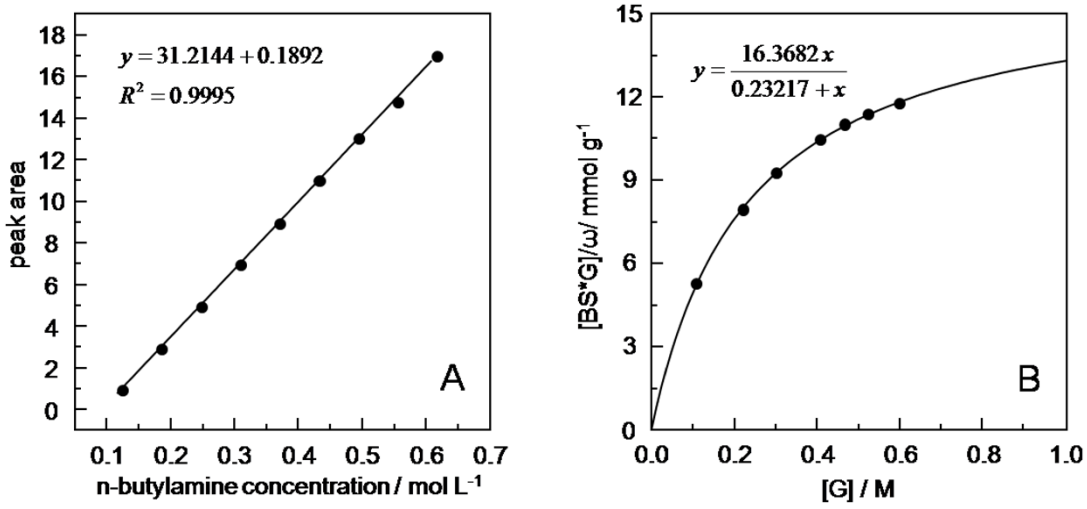


Figure S4. Linear curve of GC at various n-butylamine concentration in CCl_4 (A), Binding of host solid JUC-Z2-SO_3H with n-butylamine guest (B).

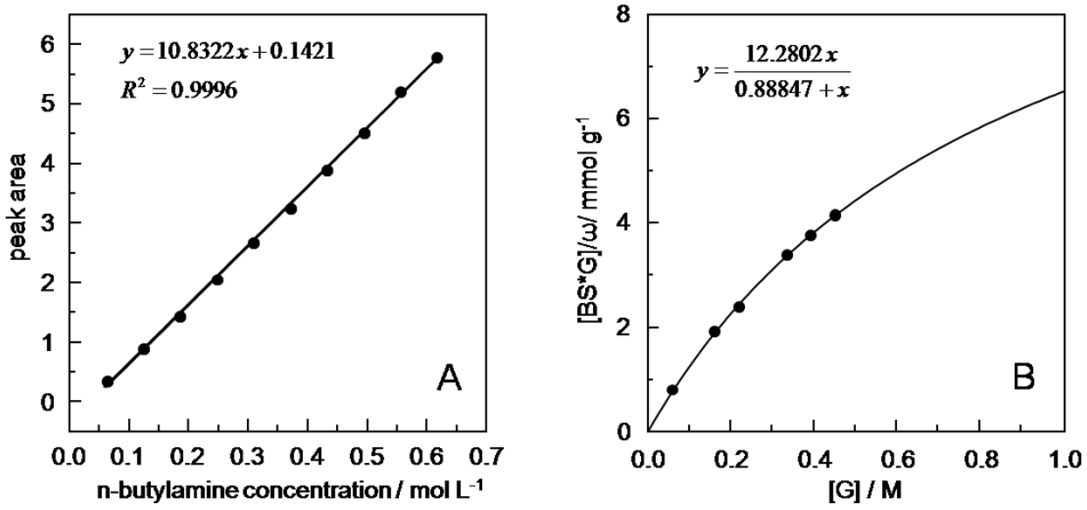


Figure S5. Linear curve of GC at various n-butylamine concentration in ethanol (A), Binding of host solid JUC-Z2-SO_3H with n-butylamine guest (B).

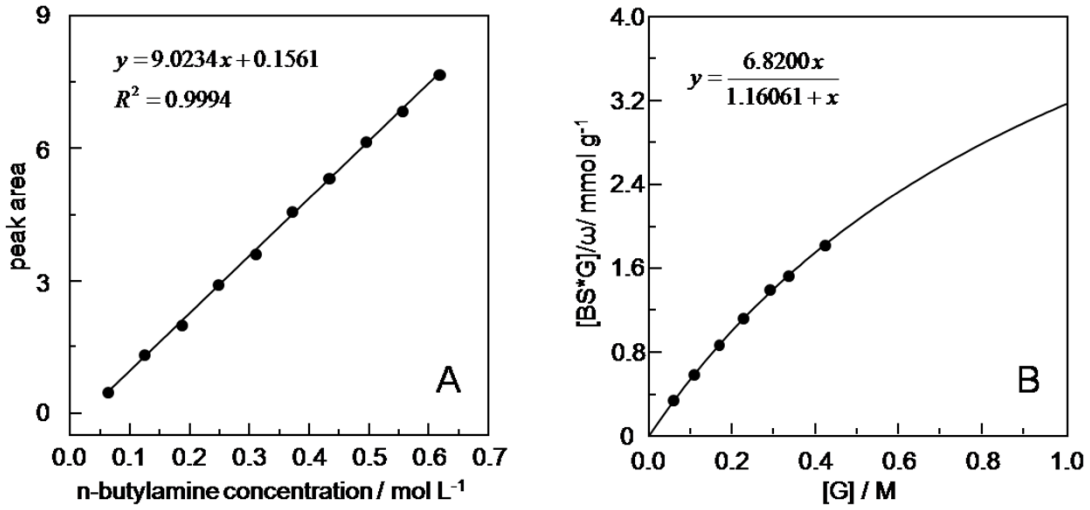


Figure S6. Linear curve of GC at various n-butylamine concentration in methanol (A), Binding of host solid JUC-Z2-SO_3H with n-butylamine guest (B).

4. Binding of host solid JUC-Z2-SO_3H with dipropylamine guest in different solvent.

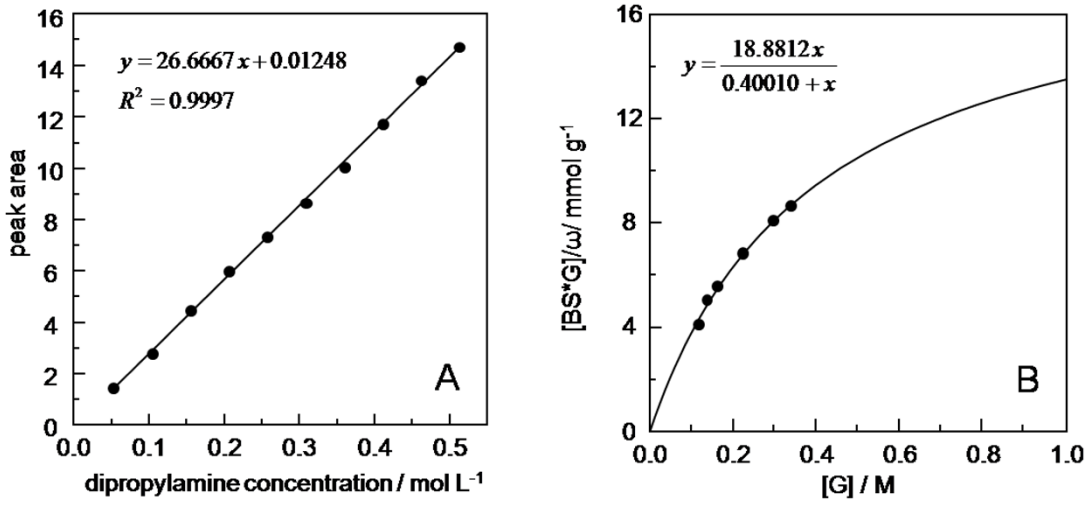


Figure S7. Linear curve of GC at various dipropylamine concentration in CCl_4 (A), Binding of host solid JUC-Z2-SO_3H with dipropylamine guest (B).

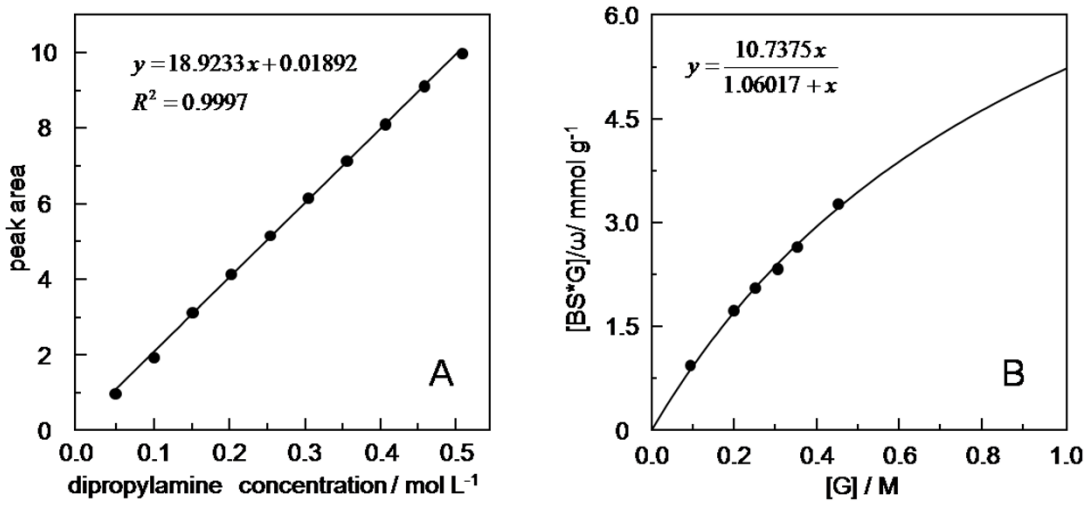


Figure S8. Linear curve of GC at various dipropylamine concentration in ethanol (A), Binding of host solid JUC-Z2-SO_3H with dipropylamine guest (B).

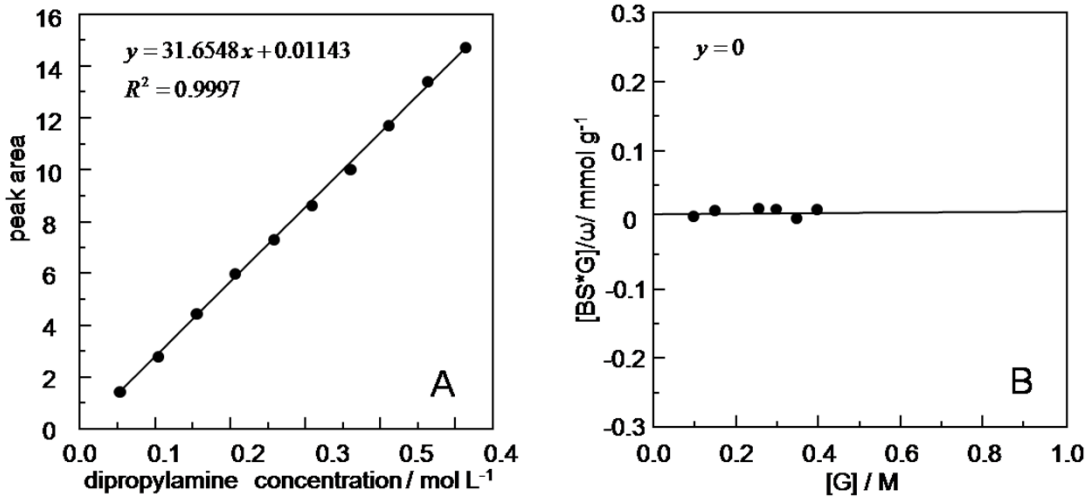


Figure S9. Linear curve of GC at various dipropylamine concentration in methanol (A), Binding of host solid JUC-Z2-SO_3H with dipropylamine guest (B).

5. Binding of host solid JUC-Z2-SO_3H with tributylamine guest in different solvent.

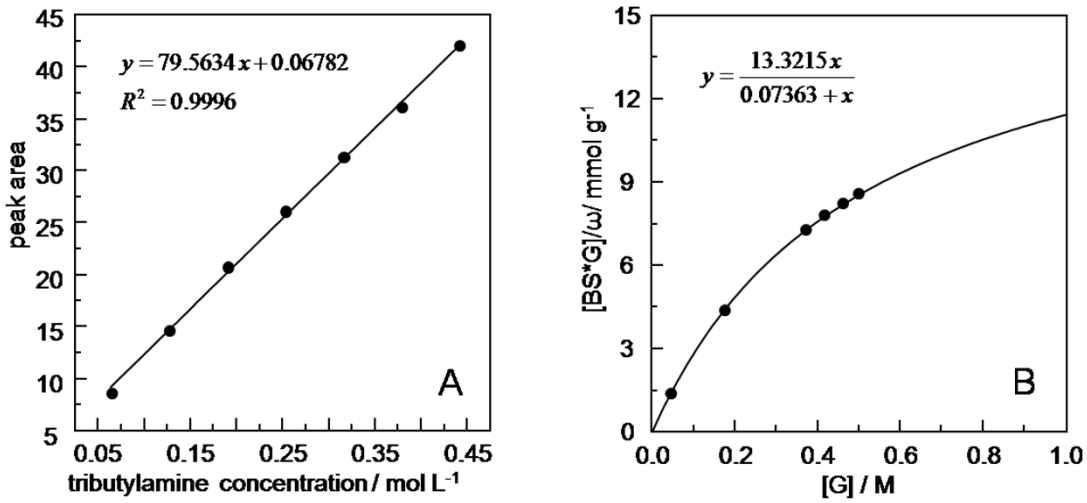


Figure S10. Linear curve of GC at various tributylamine concentration in CCl_4 (A), Binding of host solid JUC-Z2-SO_3H with tributylamine guest (B).

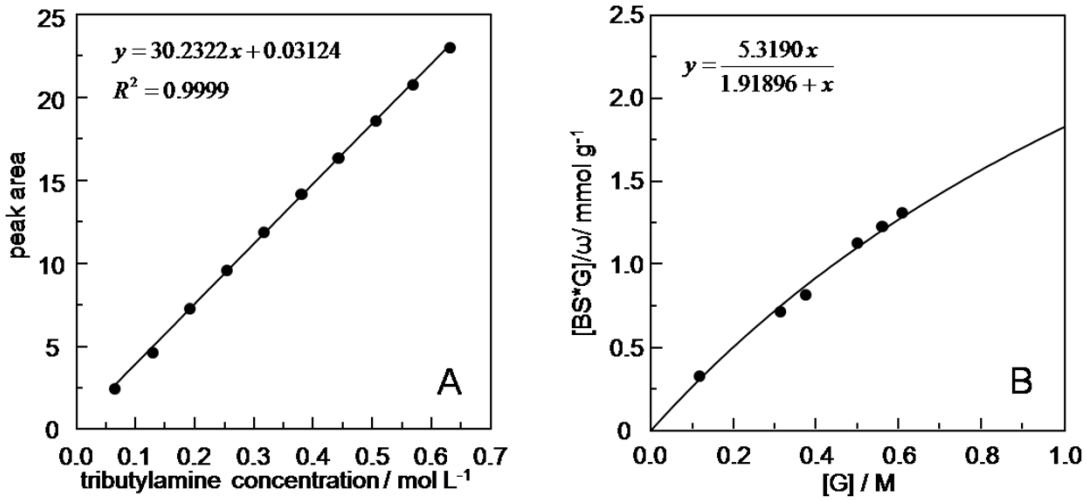


Figure S11. Linear curve of GC at various tributylamine concentration in ethanol (A), Binding of host solid JUC-Z2-SO_3H with tributylamine guest (B).

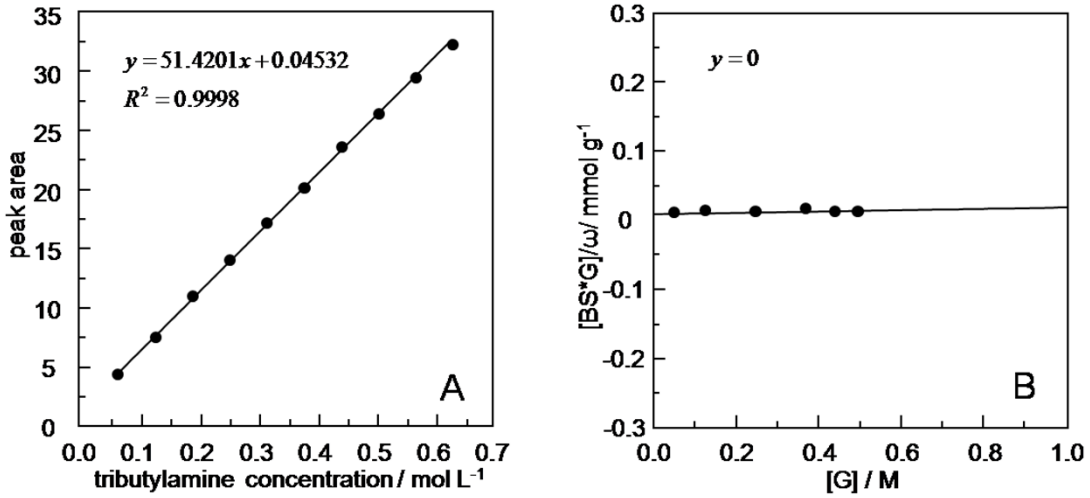


Figure S12. Linear curve of GC at various tributylamine concentration in methanol (A), Binding of host solid JUC-Z2-SO_3H with tributylamine guest (B).

6. Binding of host solid JUC-Z2-SO_3H with aniline guest in different solvent.

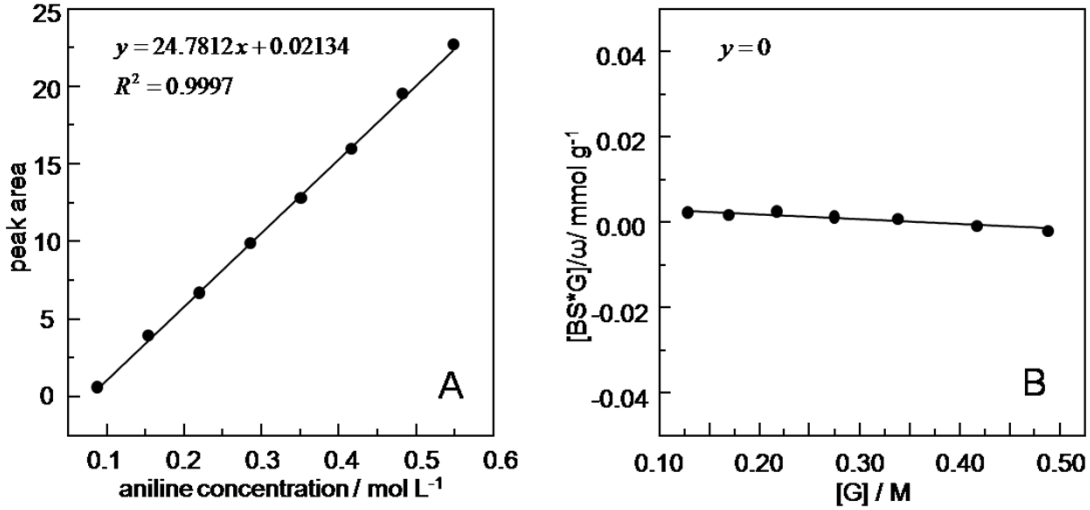


Figure S13. Linear curve of GC at various aniline concentration in CCl_4 (A), Binding of host solid JUC-Z2-SO_3H with aniline guest (B).

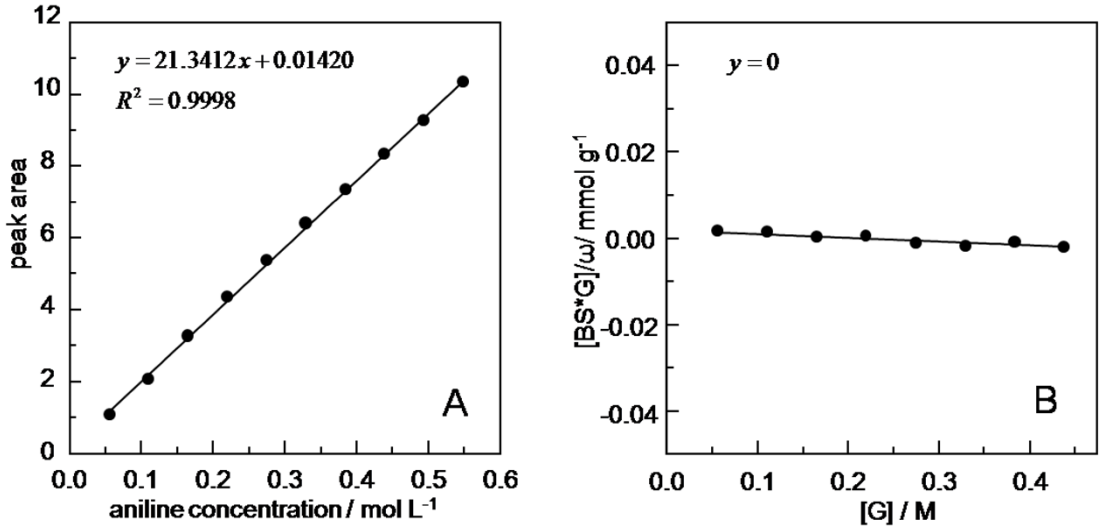


Figure S14. Linear curve of GC at various aniline concentration in ethanol (A), Binding of host solid JUC-Z2-SO_3H with aniline guest (B).

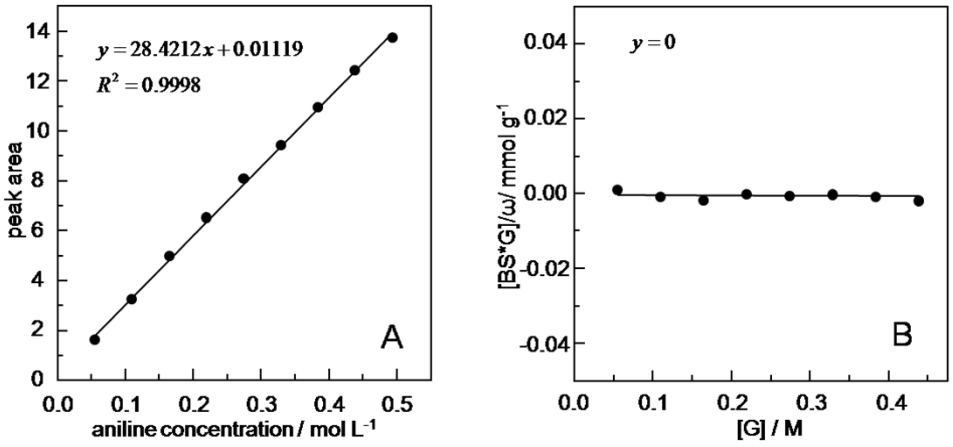


Figure S15. Linear curve of GC at various aniline concentration in methanol (A), Binding of host solid JUC-Z2-SO_3H with aniline guest (B).

7. Binding of host solid JUC-Z2-SO_3H with N,N-Dimethylformamide guest in different solvent.

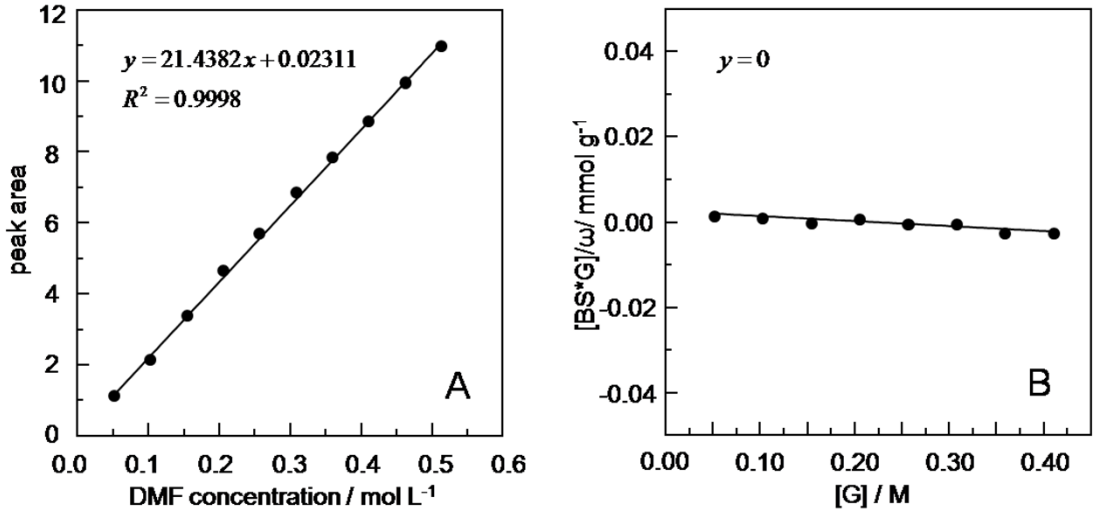


Figure S16. Linear curve of GC at various N,N-Dimethylformamide concentration in CCl_4 (A), Binding of host solid JUC-Z2-SO_3H with N,N-Dimethylformamide guest (B).

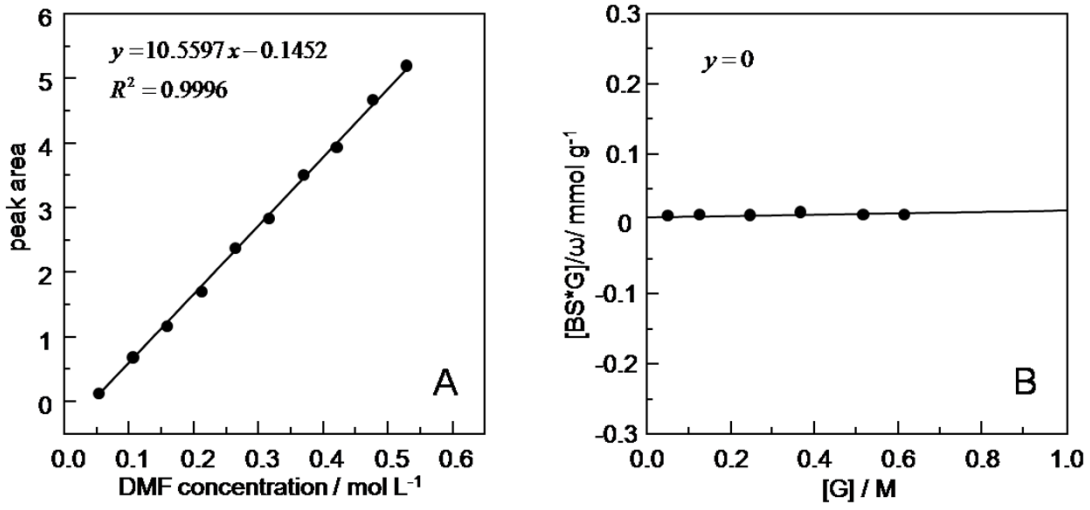


Figure S17. Linear curve of GC at various N,N-Dimethylformamide concentration in ethanol (A), Binding of host solid JUC-Z2-SO_3H with N, N-Dimethylform- amide guest (B).

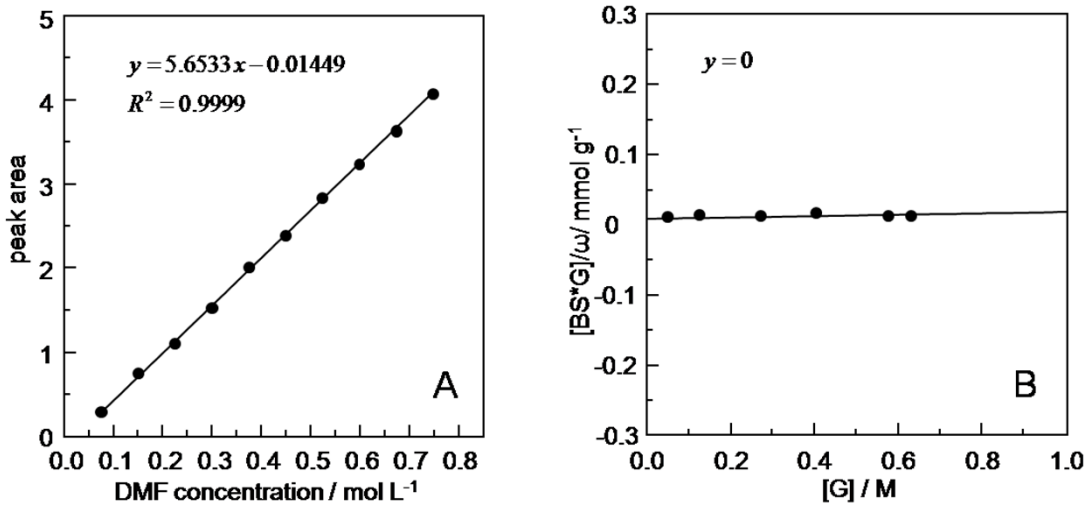


Figure S18. Linear curve of GC at various N,N-Dimethylformamide concentration in methanol (A), Binding of host solid JUC-Z2-SO_3H with N,N-Dimethylformamide guest (B).

8. Binding of host solid JUC-Z2-SO_3H with N- methyl pyrrolidone guest in different solvent.

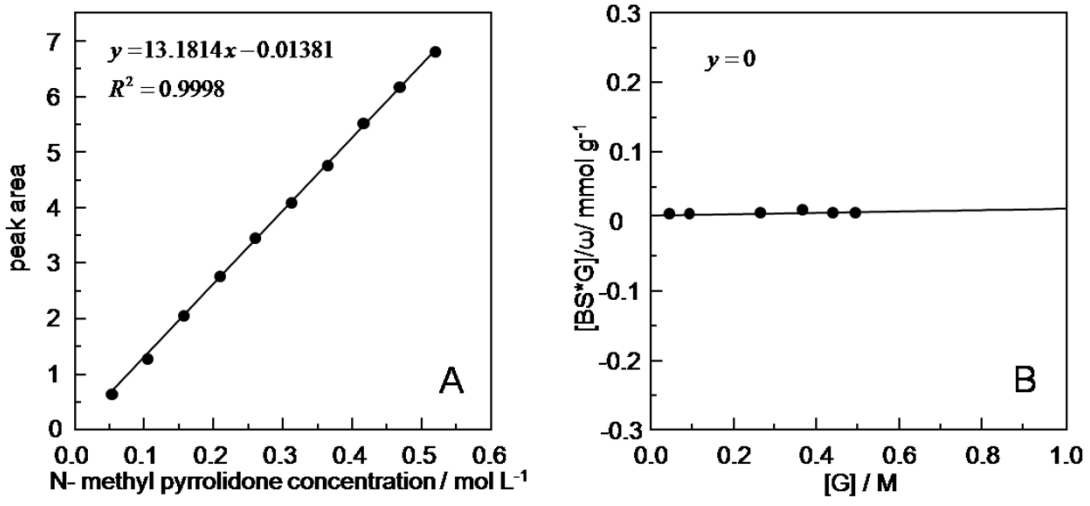


Figure S19. Linear curve of GC at various N- methyl pyrrolidone concentration in CCl_4 (A), Binding of host solid JUC-Z2-SO_3H with N- methyl pyrrolidone guest (B).

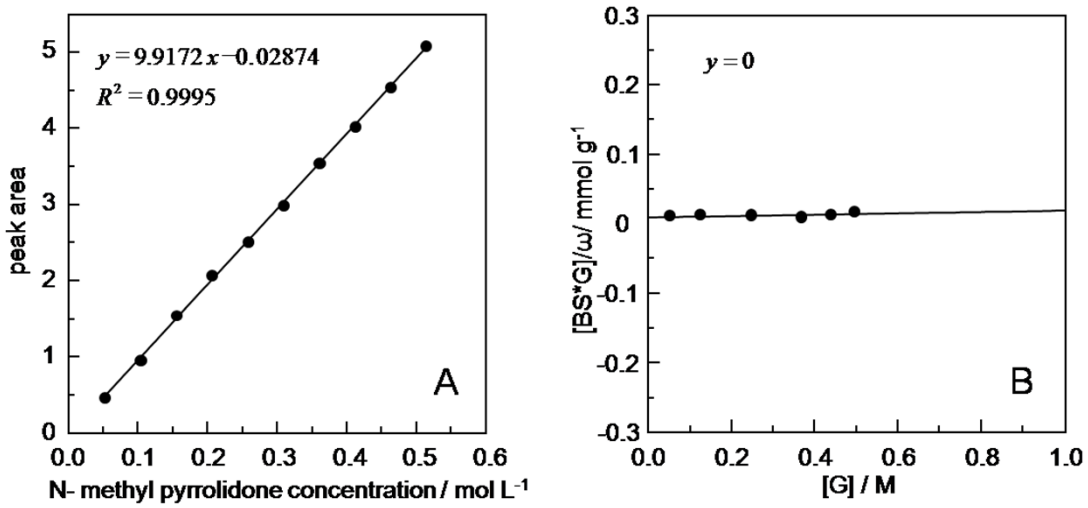
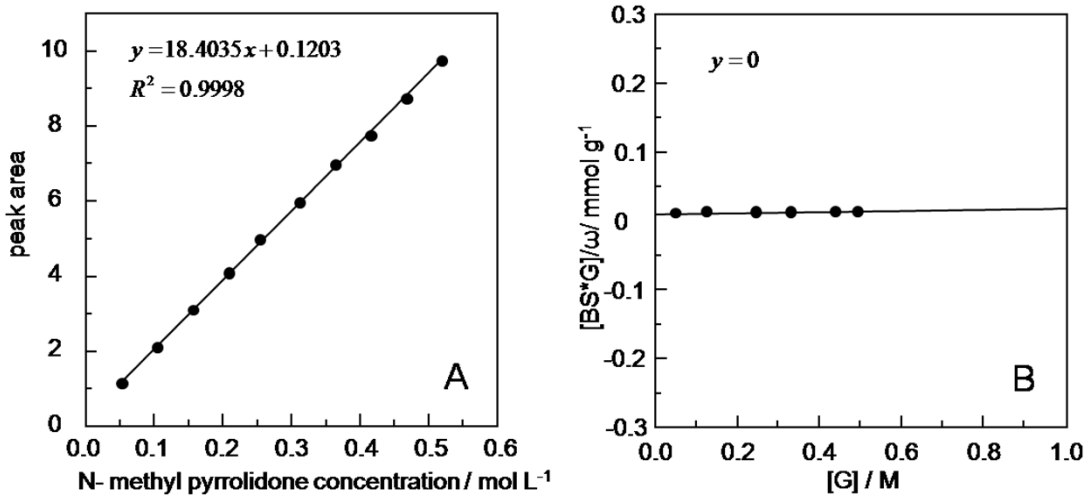


Figure S20. Linear curve of GC at various N- methyl pyrrolidone concentration in ethanol (A), Binding of host solid JUC-Z2-SO_3H with N- methyl pyrrolidone guest (B).



FigureS21. Linear curve of GC at various N- methyl pyrrolidone concentration in methanol (A), Binding of host solid JUC-Z2-SO_3H with N- methyl pyrrolidone guest (B).

9. Binding of host solid JUC-Z2 with ethylenediamine guest in different solvent.

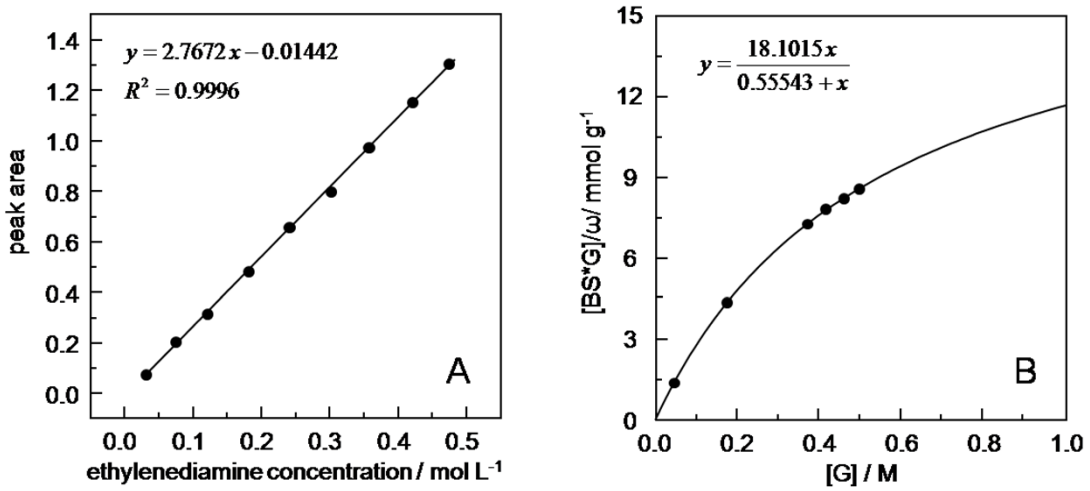


Figure S22. Linear curve of GC at various ethylenediamine concentration in CCl_4 (A), Binding of host solid JUC-Z2 with ethylenediamine Guest (B).

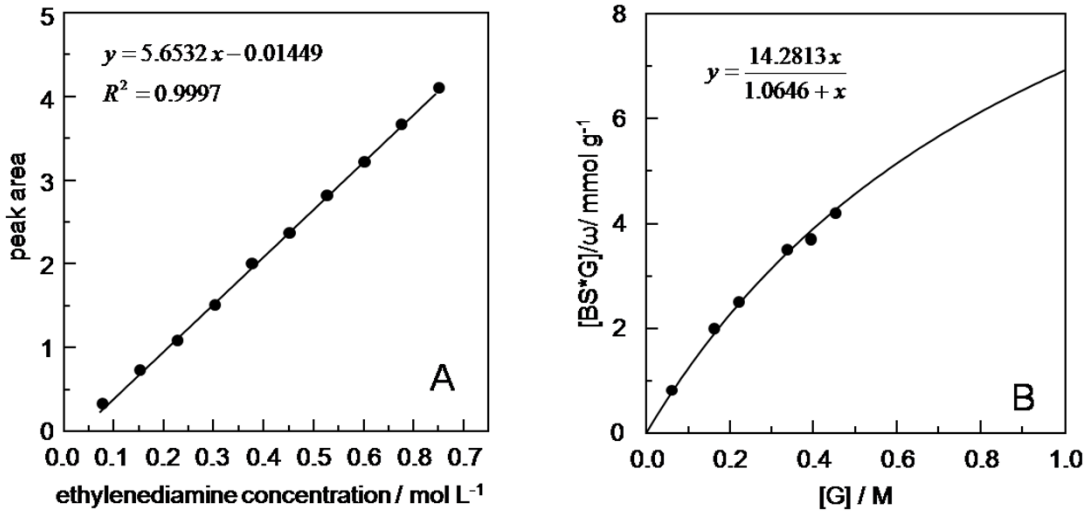


Figure S23. Linear curve of GC at various ethylenediamine concentration in ethanol (A), Binding of host solid JUC-Z2 with ethylenediamine Guest (B).

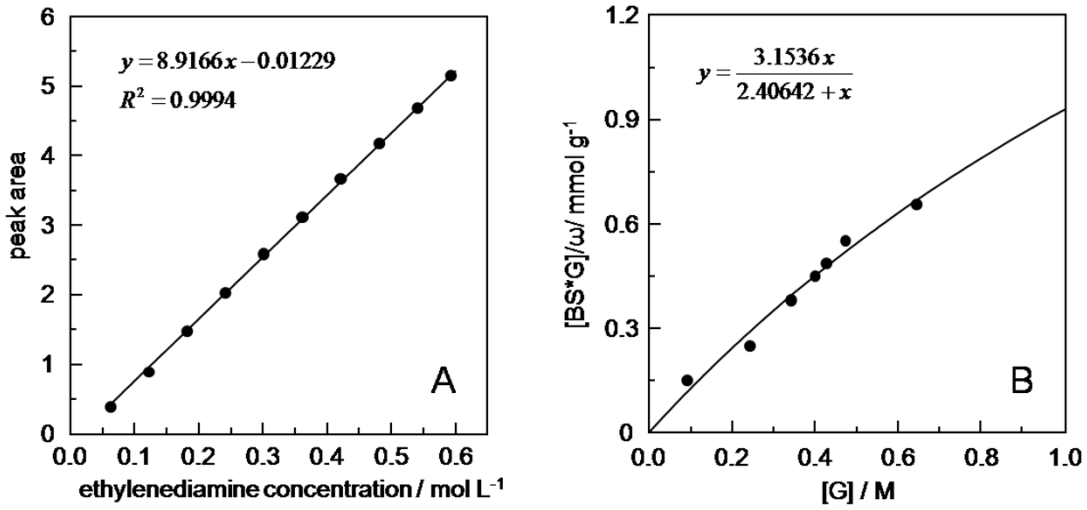


Figure S24. Linear curve of GC at various ethylenediamine concentration in methanol (A), Binding of host solid JUC-Z2 with ethylenediamine Guest (B).

10. Binding of host solid JUC-Z2 with n-butylamine guest in different solvent.

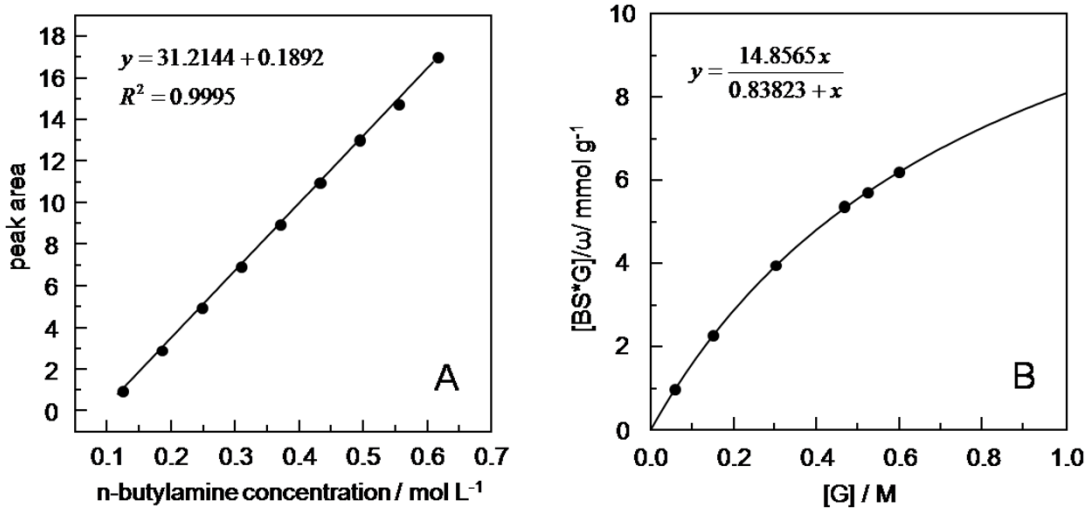


Figure S25. Linear curve of GC at various n-butylamine concentration in CCl_4 (A), Binding of host solid JUC-Z2 with n-butylamine guest (B).

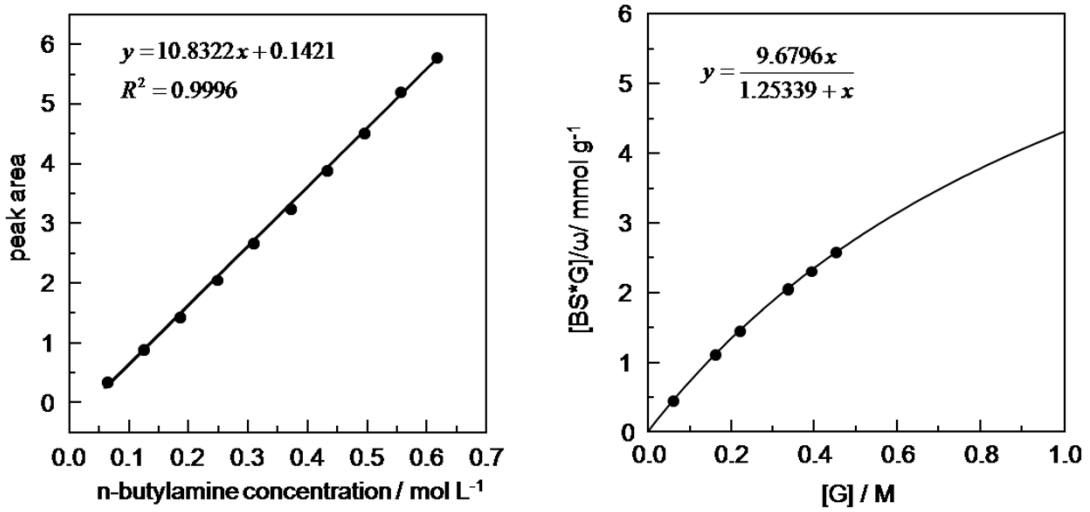


Figure S26. Linear curve of GC at various n-butylamine concentration in ethanol (A), Binding of host solid JUC-Z2 with n-butylamine guest (B).

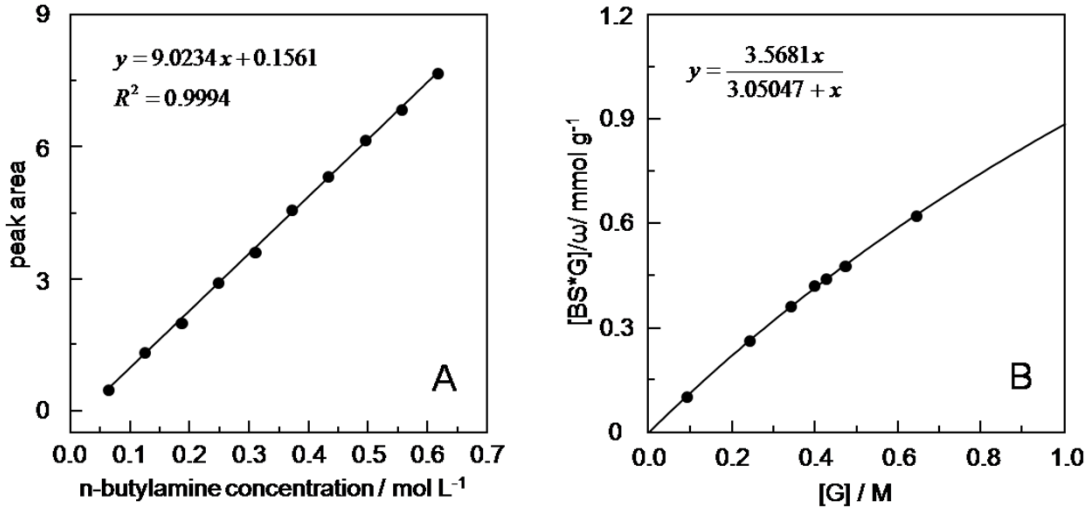


Figure S27. Linear curve of GC at various n-butylamine concentration in methanol (A), Binding of host solid JUC-Z2 with n-butylamine guest (B).

11. Binding of host solid JUC-Z2 with dipropylamine guest in different solvent.

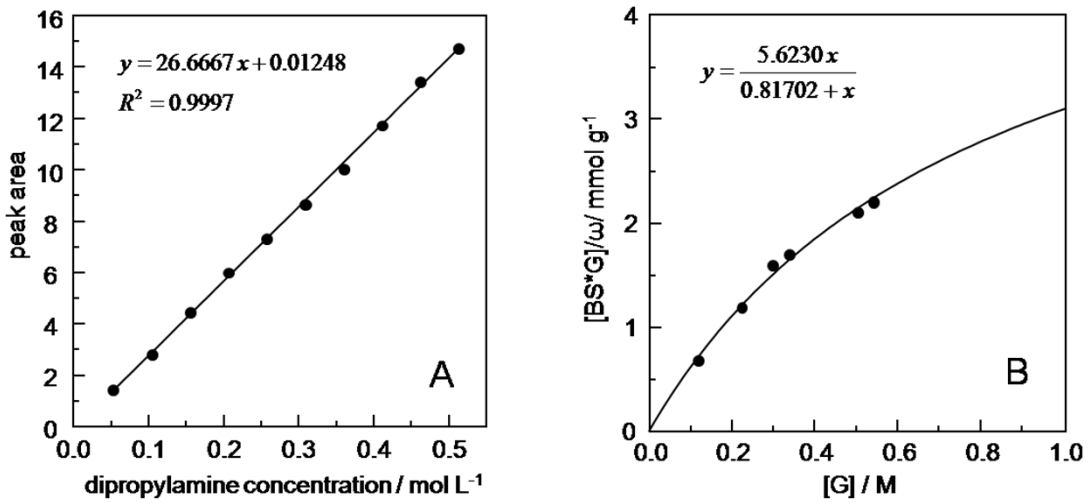


Figure S28. Linear curve of GC at various dipropylamine concentration in CCl_4 (A), Binding of host solid JUC-Z2 with dipropylamine guest (B).

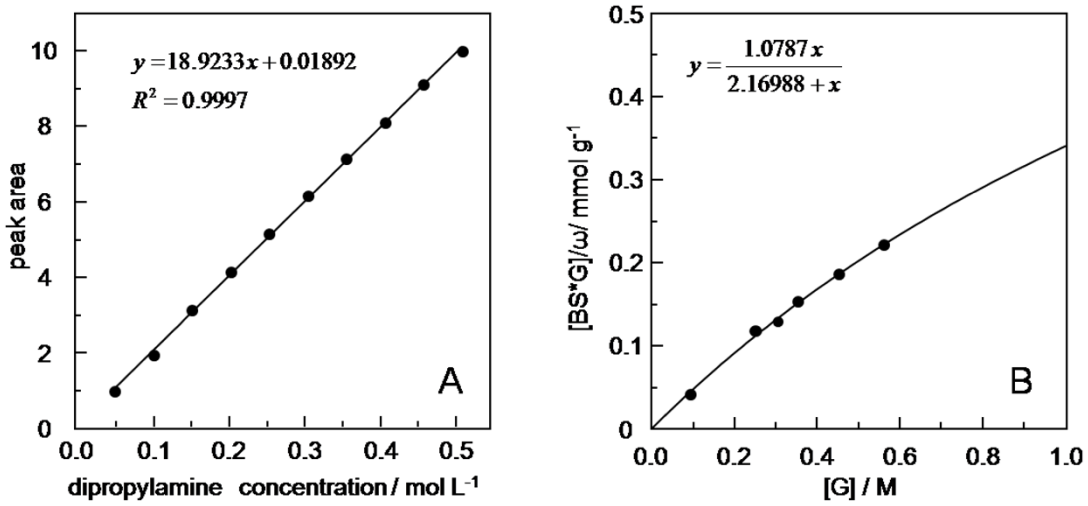


Figure S29. Linear curve of GC at n various dipropylamine concentration in ethanol (A), Binding of host solid JUC-Z2 with dipropylamine guest (B).

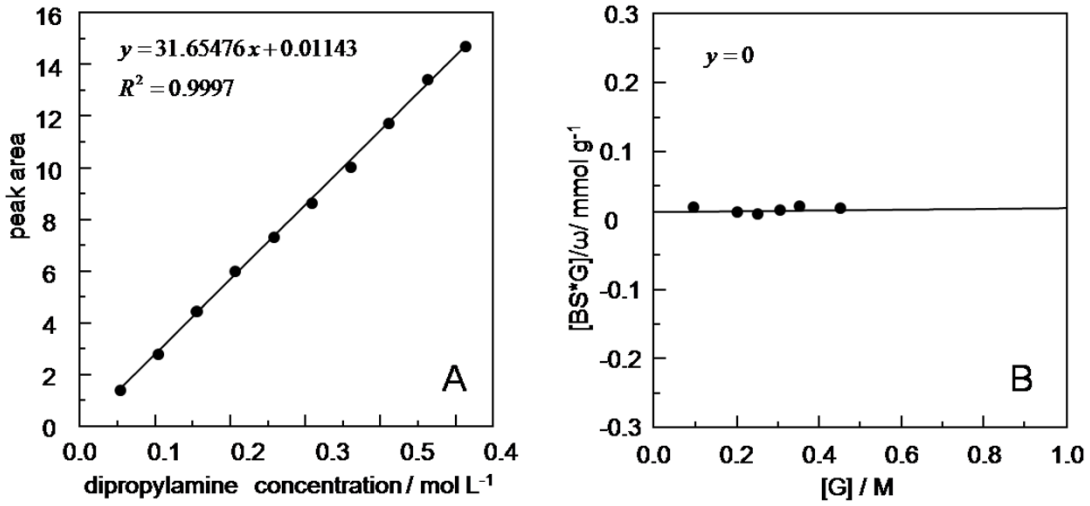


Figure S30. Linear curve of GC at various dipropylamine concentration in methanol (A), Binding of host solid JUC-Z2 with dipropylamine guest (B).

12. Binding of host solid JUC-Z2 with tributylamine guest in different solvent.

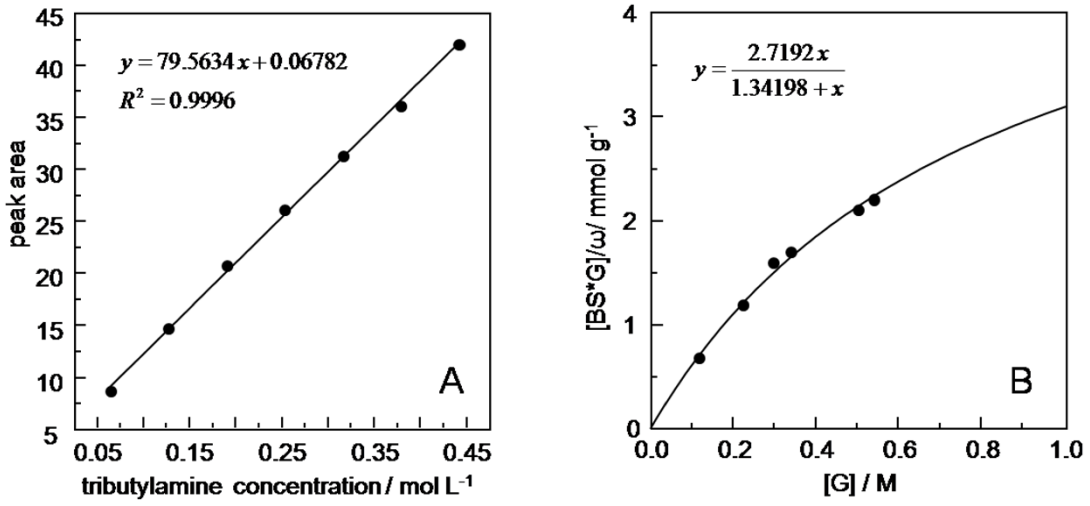


Figure S31. Linear curve of GC at various tributylamine concentration in CCl_4 (A), Binding of host solid JUC-Z2 with tributylamine guest (B).

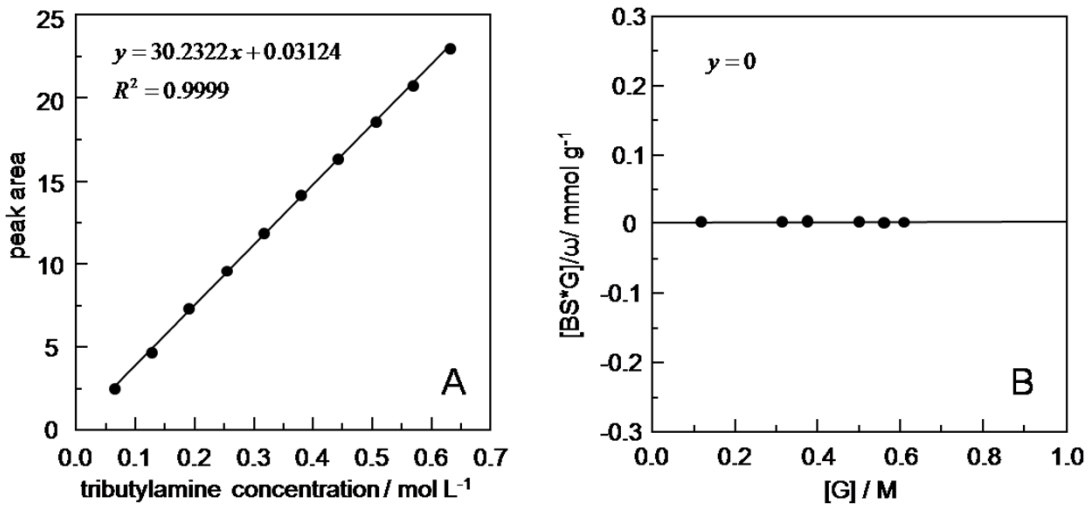


Figure S32. Linear curve of GC at various tributylamine concentration in ethanol（left）Binding of host solid JUC-Z2 with tributylamine guest (right).

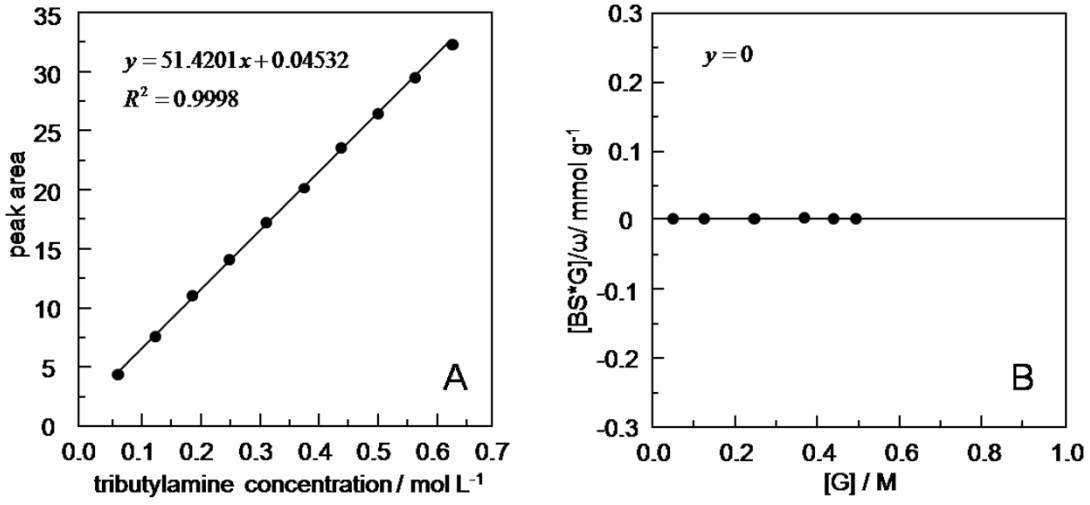


Figure S33. Linear curve of GC at various tributylamine concentration in methanol (A), Binding of host solid JUC-Z2 with tributylamine guest (B).

13. Binding of host solid JUC-Z2 with aniline guest in different solvent.

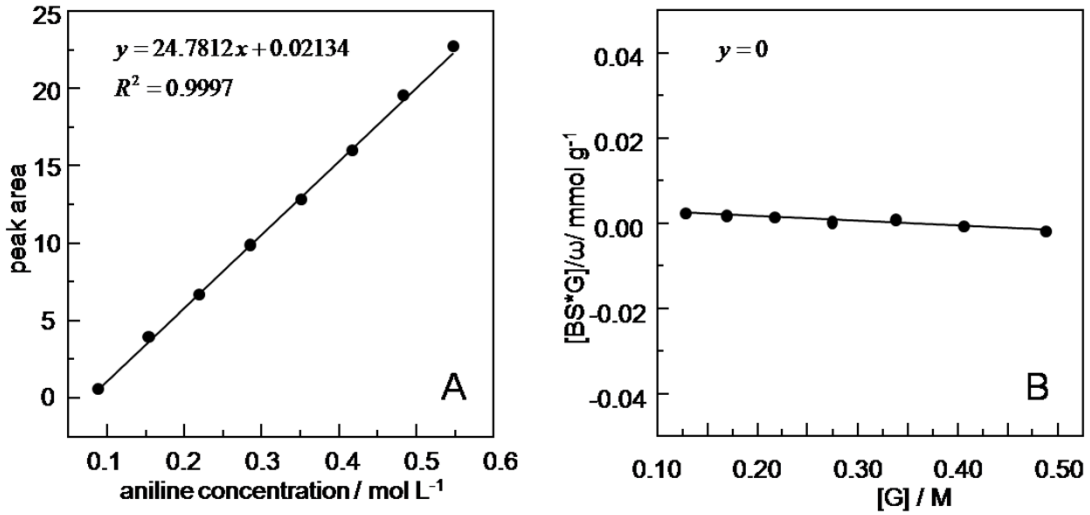


Figure S34. Linear curve of GC at various aniline concentration in CCl_4 (A), Binding of host solid JUC-Z2 with aniline guest (B).

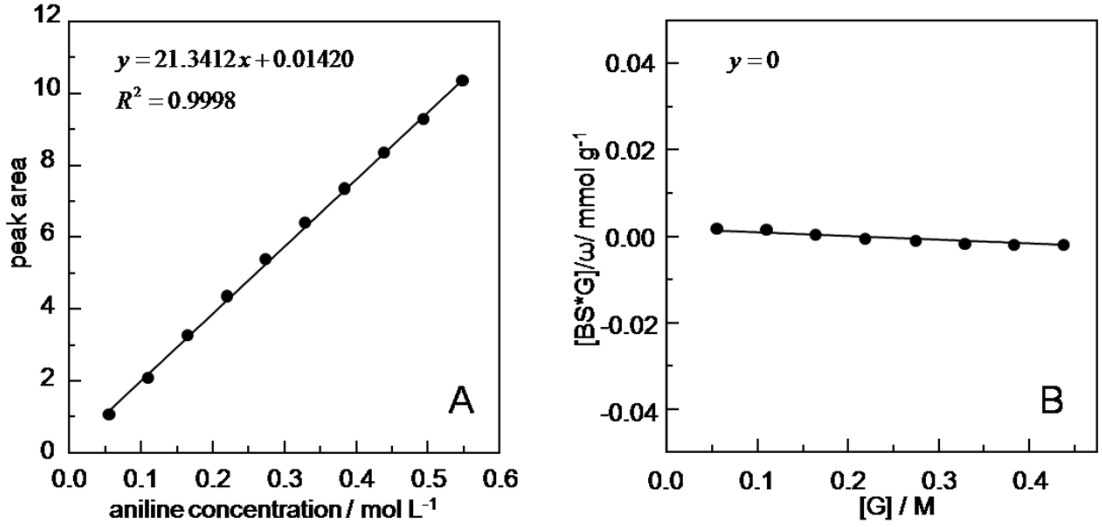


Figure S35. Linear curve of GC at various aniline concentration in ethanol (A), Binding of host solid JUC-Z2 with aniline guest (B).

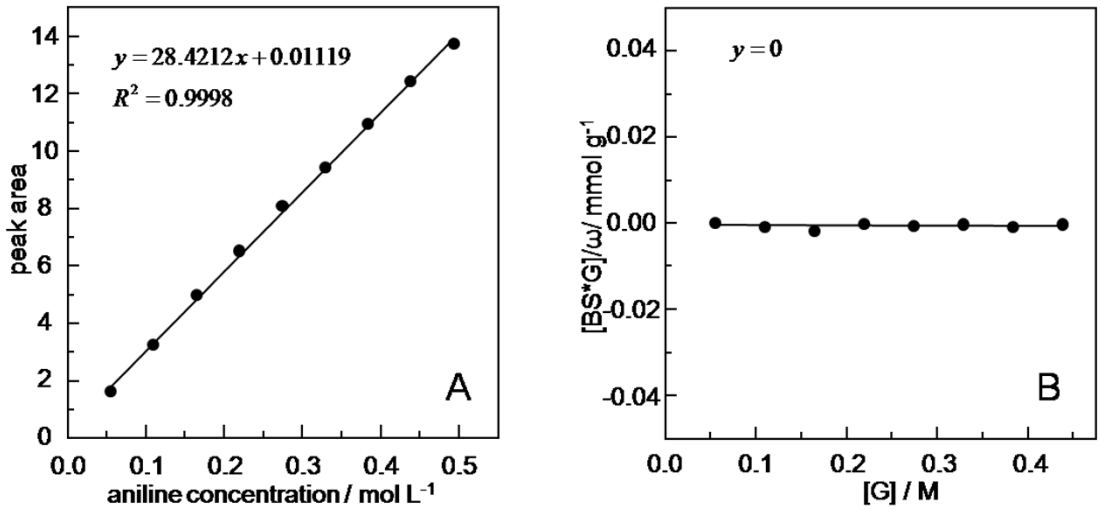


Figure S36. Linear curve of GC at various aniline concentration in methanol (A), Binding of host solid JUC-Z2 with aniline guest (B).

14. Binding of host solid JUC-Z2 with N, N-Dimethylformamide guest in different solvent.

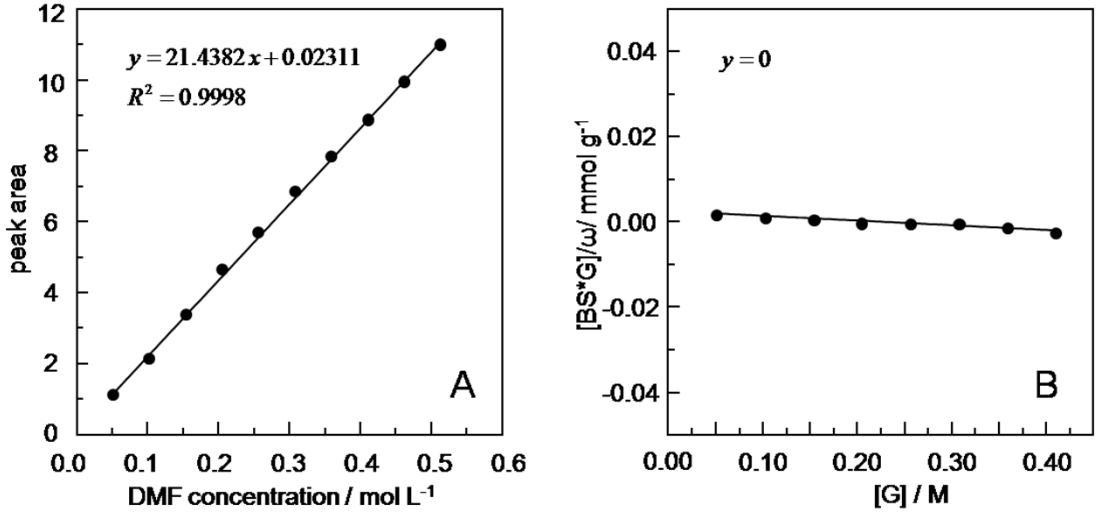


Figure S37. Linear curve of GC at various N,N-Dimethylformamide concentration in CCl_4 (A), Binding of host solid JUC-Z2 with N,N-Dimethylformamide guest (B).

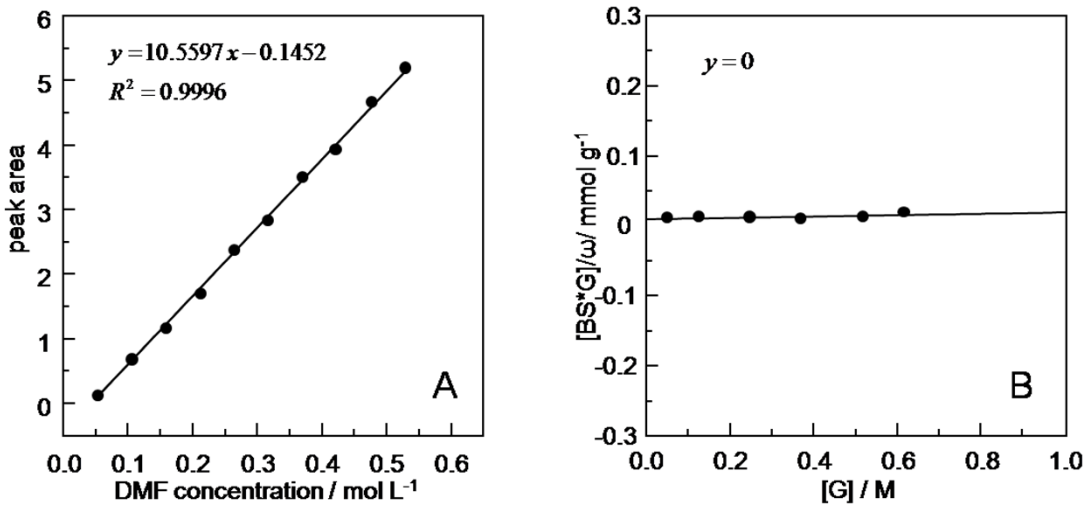


Figure S38. Linear curve of GC at various N, N-Dimethylformamide concentration in ethanol (A), Binding of host solid JUC-Z2 with N, N-Dimethylformamide guest (B).

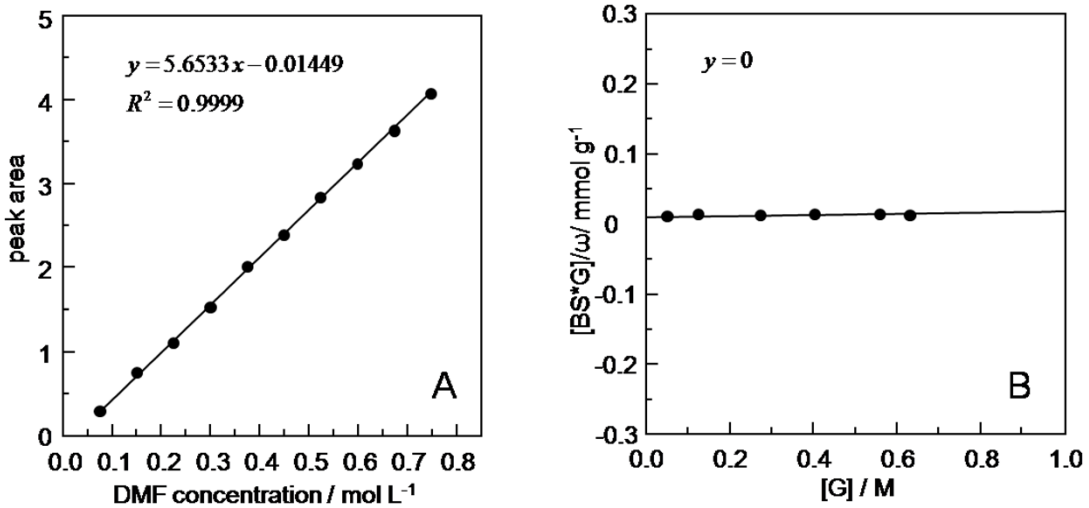


Figure S39. Linear curve of GC at various N, N-Dimethylformamide concentration in methanol (A), Binding of host solid JUC-Z2 with N, N-Dimethylformamide guest (B).

15. Binding of host solid JUC-Z2 with N- methyl pyrrolidone guest in different solvent.

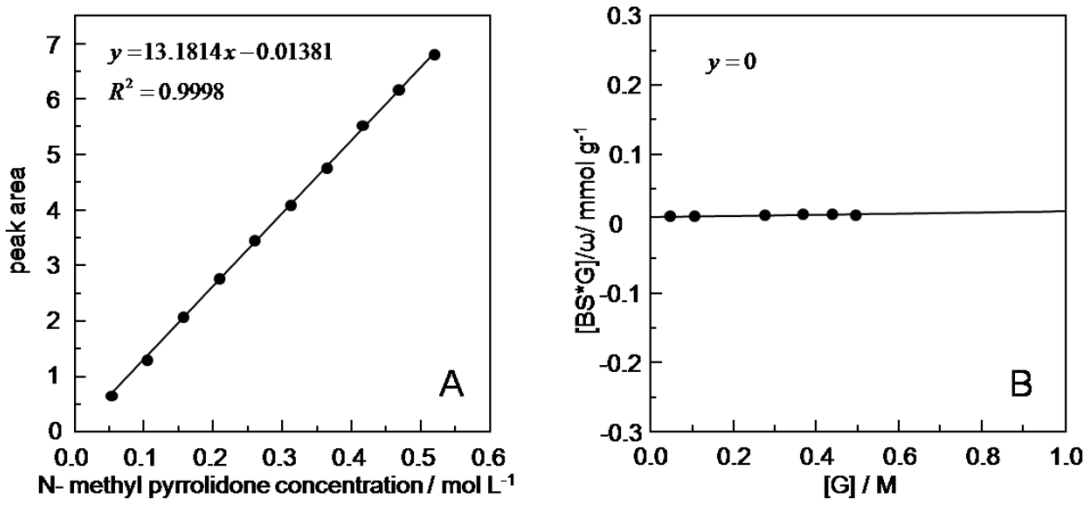


Figure S40. Linear curve of GC at various N- methyl pyrrolidone concentration in CCl_4 (A), Binding of host solid JUC-Z2-SO_3H with N- methyl pyrrolidone guest (B).

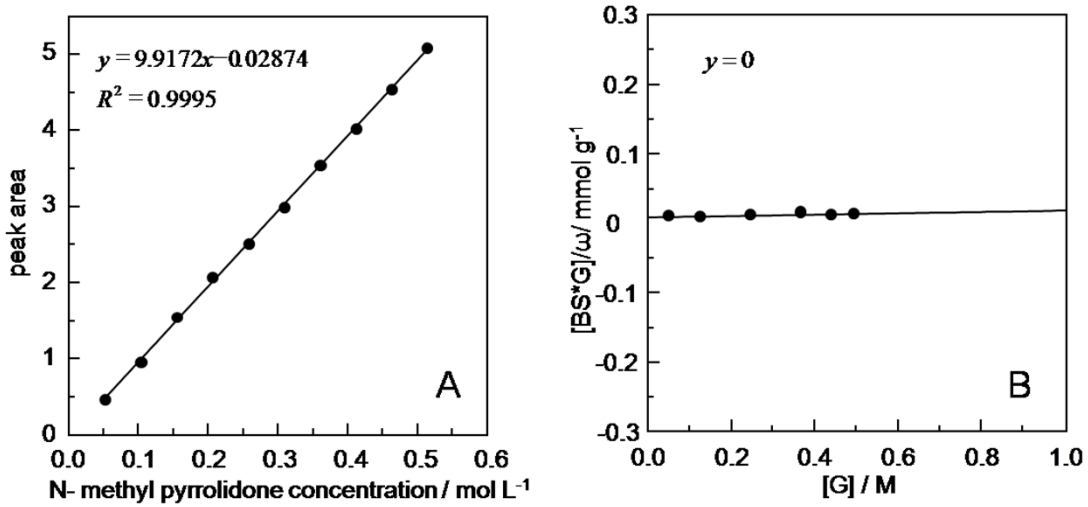


Figure S41. Linear curve of GC at various N- methyl pyrrolidone concentration in ethanol (A), Binding of host solid JUC-Z2-SO_3H with N- methyl pyrrolidone guest (B).

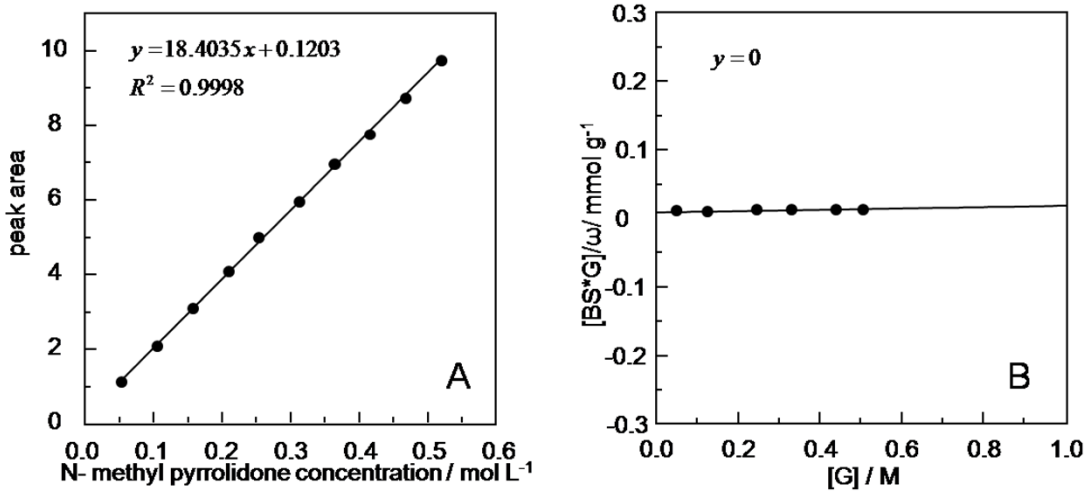


Figure S42. Linear curve of GC at various N- methyl pyrrolidone concentration in methanol (A), Binding of host solid JUC-Z2 with N- methyl pyrrolidone guest (B).