Electronic Supplementary Information

Construction of a novel INHIBIT logic gate through fine-tuned assembly of anthryl fluorophore *via* selective anion recognition and host-guest interaction

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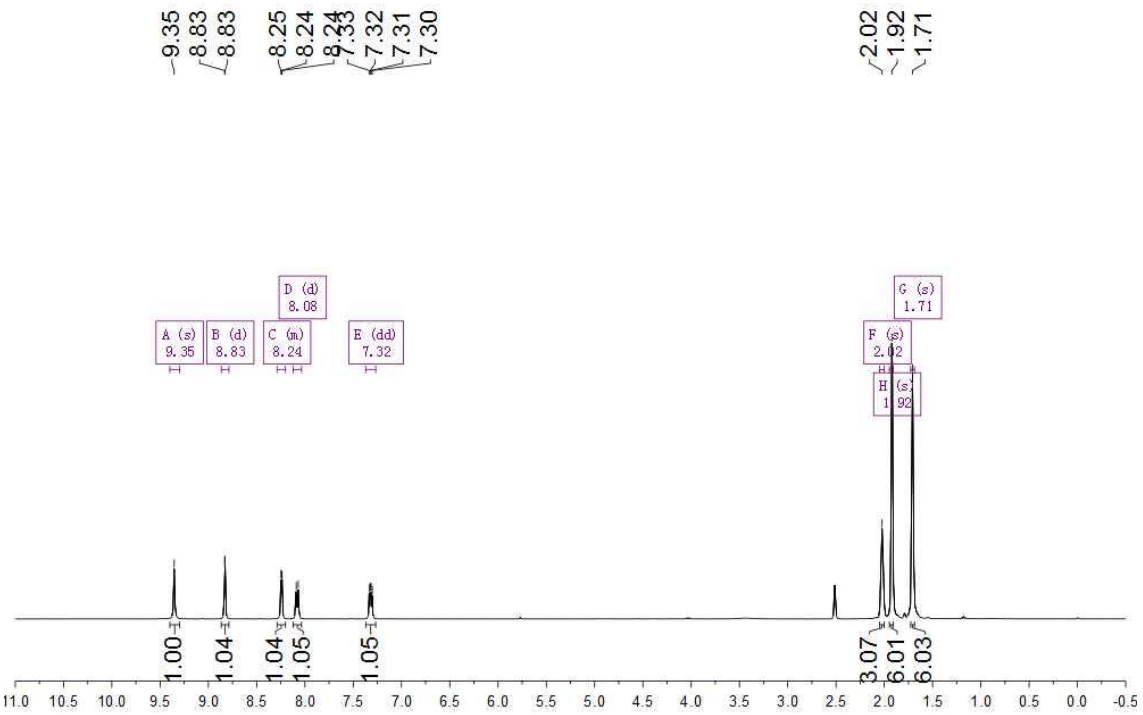

Fig. S1 ^{1}H NMR of N-(1-adamantoyl)-3-aminopyridine in DMSO-d_6.

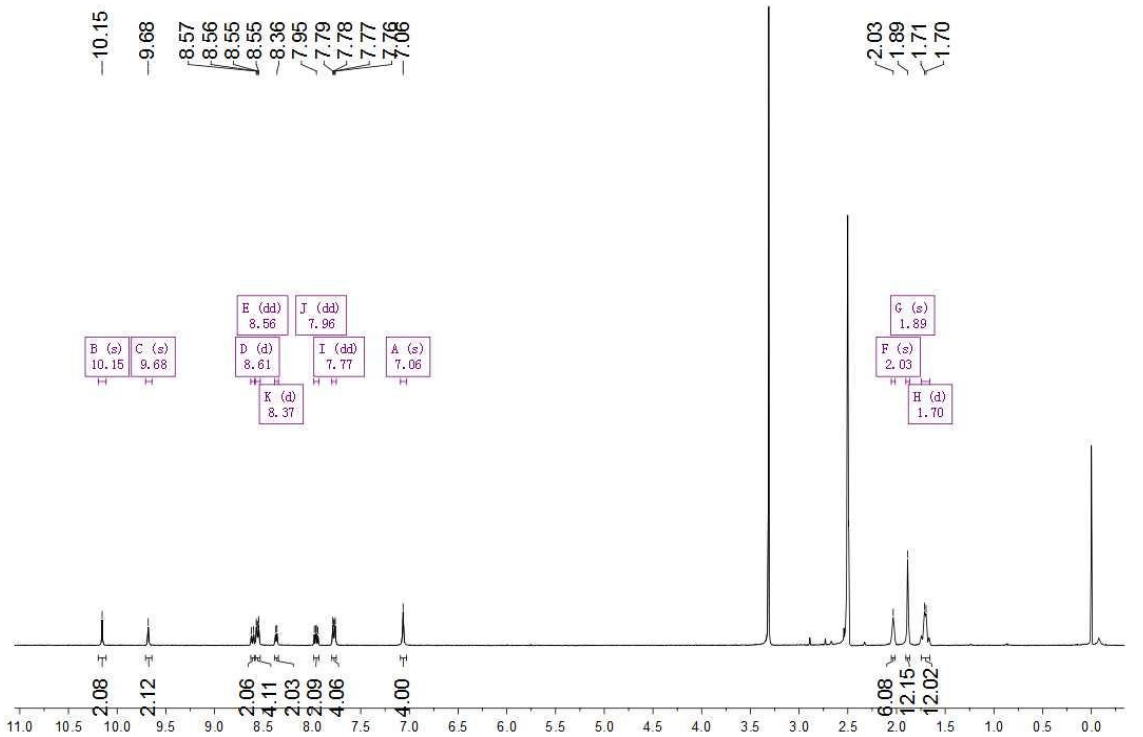

Fig. S2 ^{1}H NMR spectrum of **AAP** in DMSO-d_6.

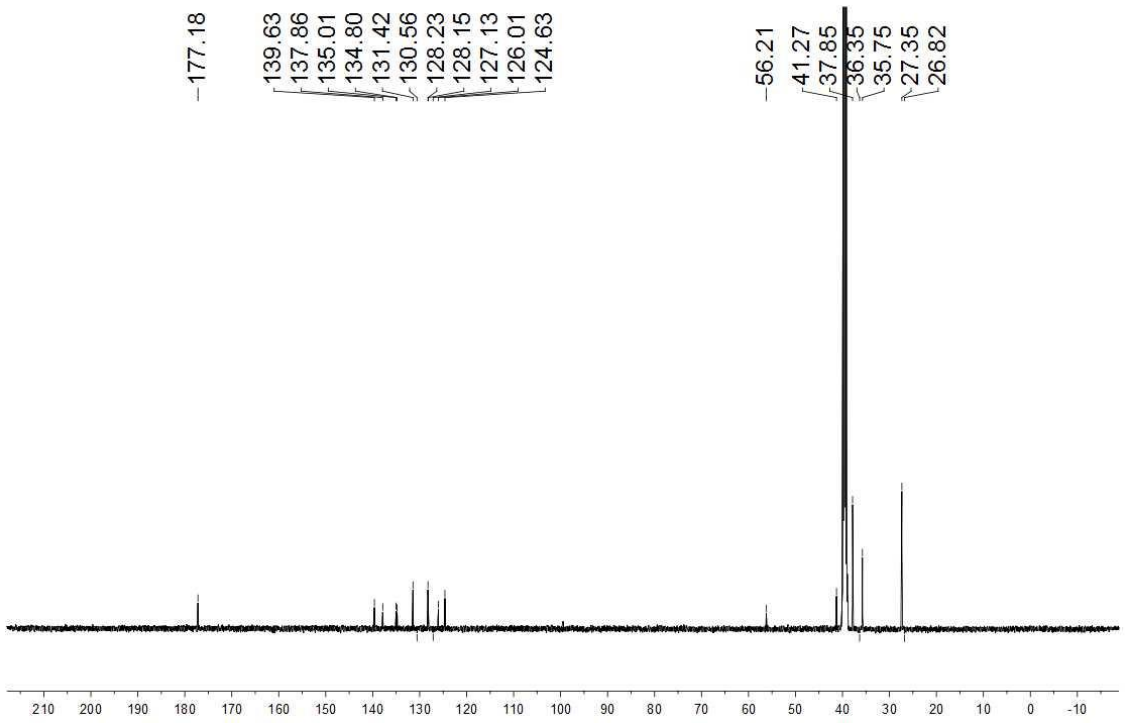

Fig. S3 ^{13}C NMR spectrum of **AAP** in DMSO-d_6.

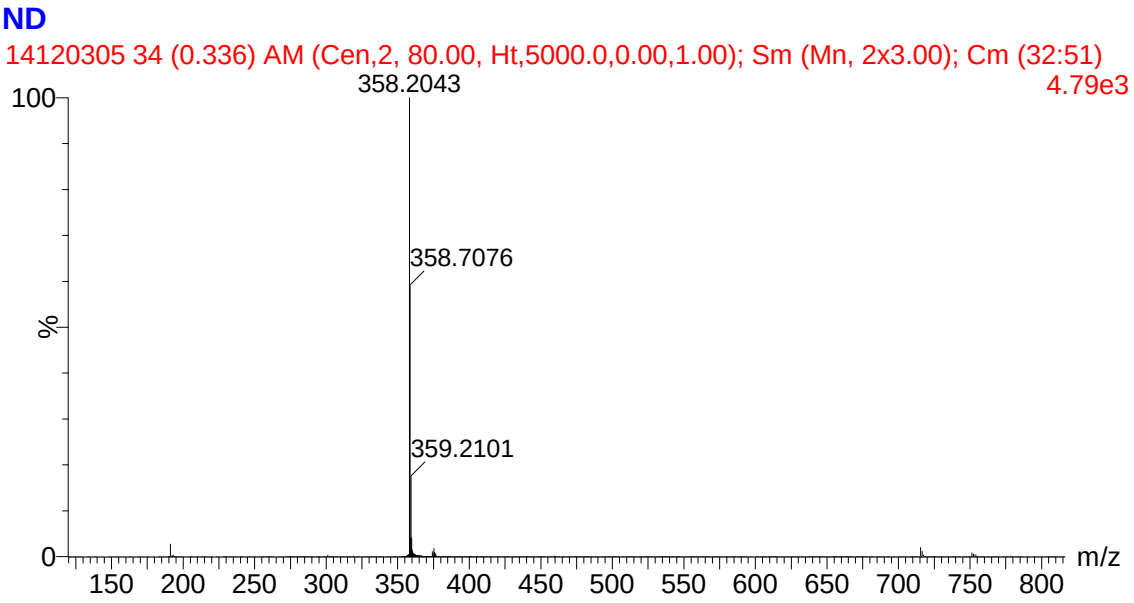

Fig. S4 HRMS of **AAP**.

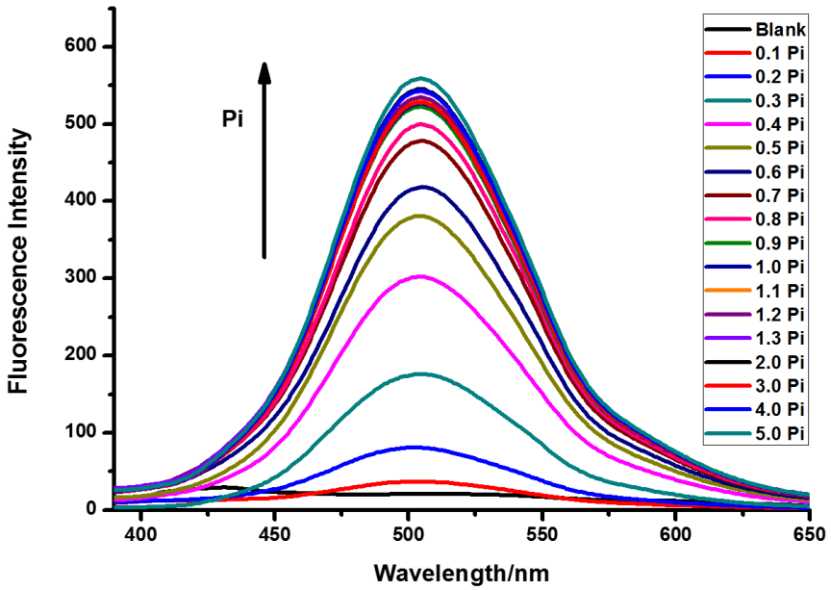

Fig. S5 Fluorescence titration spectra of **AAP** (5 μM) upon addition of various amounts of Pi in CH_3CN (λ_{ex}=360 nm)

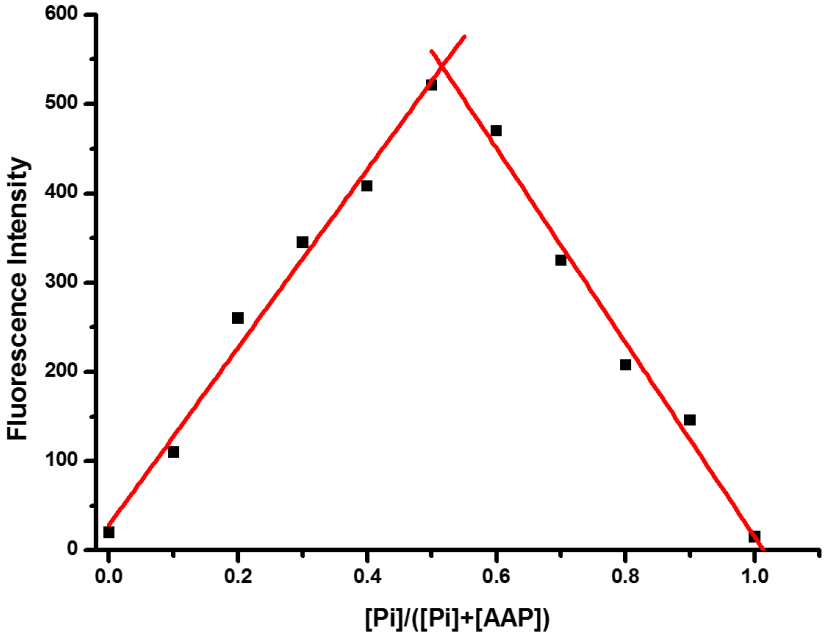

Fig. S6 Job plot of emission intensity changes at 500 nm

Binding Constant: The Benesi-Hildebrand equation for 1:1 complex formation between host and gust molecule[1]:

$$\Delta F_{max} / \Delta F = 1 + (1 / K_{BH^*}[M])$$

Where

K_{BH} is the binding constant of the complexation;

[M] is the concentration of the variant (Here in our case, it is the concentration of Pi);

A plot of $\Delta F_{max} / \Delta F$ vs. 1/[M] will yield a straight line with slope $1/K_{BH}$. The inverse of slope is the binding constant.

Detection Limit: The detection limit was determined from the fluorescence titration data based on a reported method.[2] According to the result of titration experiment, the fluorescent intensity data at 500 nm were normalized between the minimum intensity and the maximum intensity. A plot of $(I - I_{min})/(I_{max} - I_{min})$ vs. $\log_{[M]}$ will yield a straight line and the point at which this line crossed the X axis was considered as the detection limit.

References:

1. K. A. Conners, Binding Constants, *The Measurement of Molecular Complex Stability*; Wiley: New York, 1987.
2. W. T. Gong, B. Gao, J. Z. Zhao and G. L. Ning, *J. Mater. Chem. A.* 2003, **1**, 5501-5504.