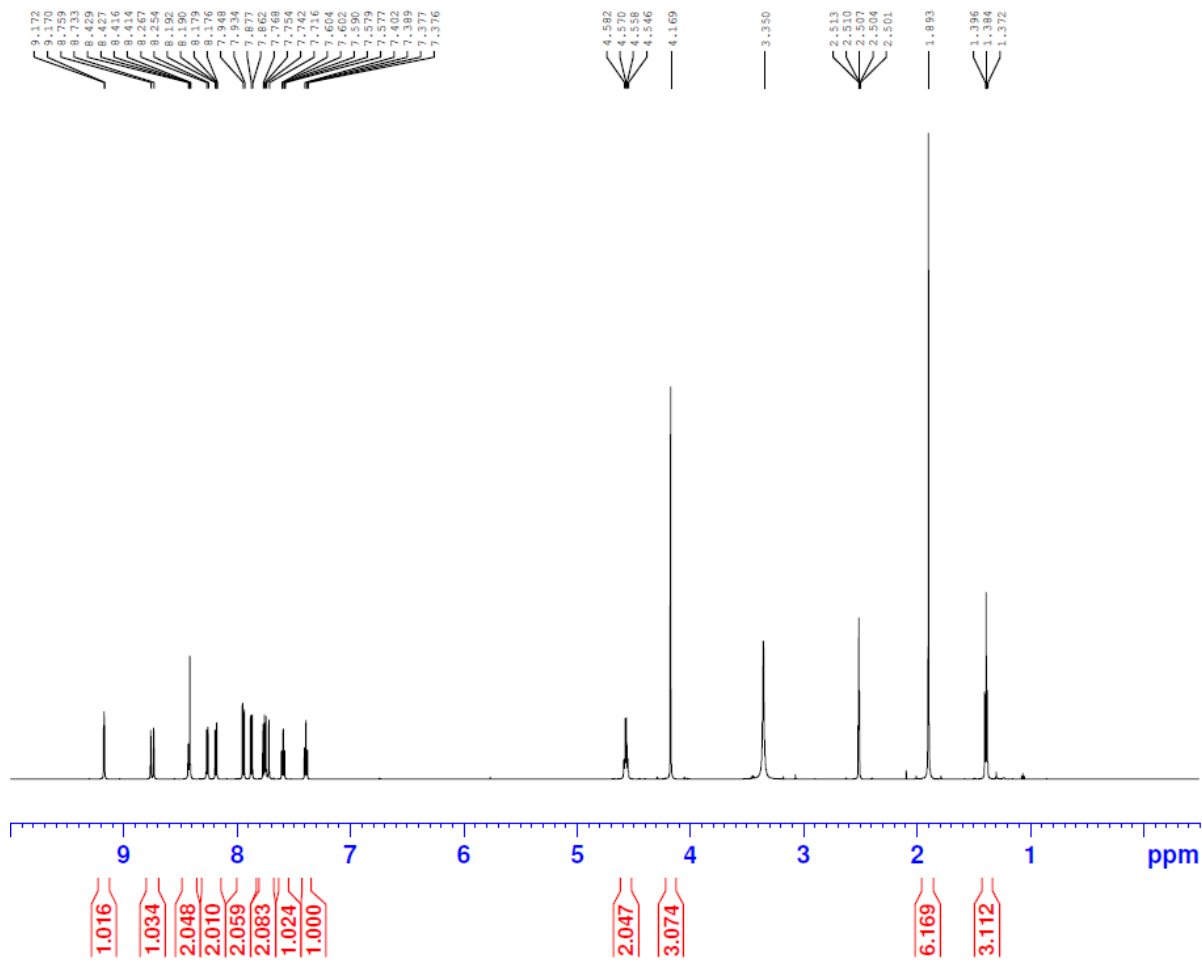


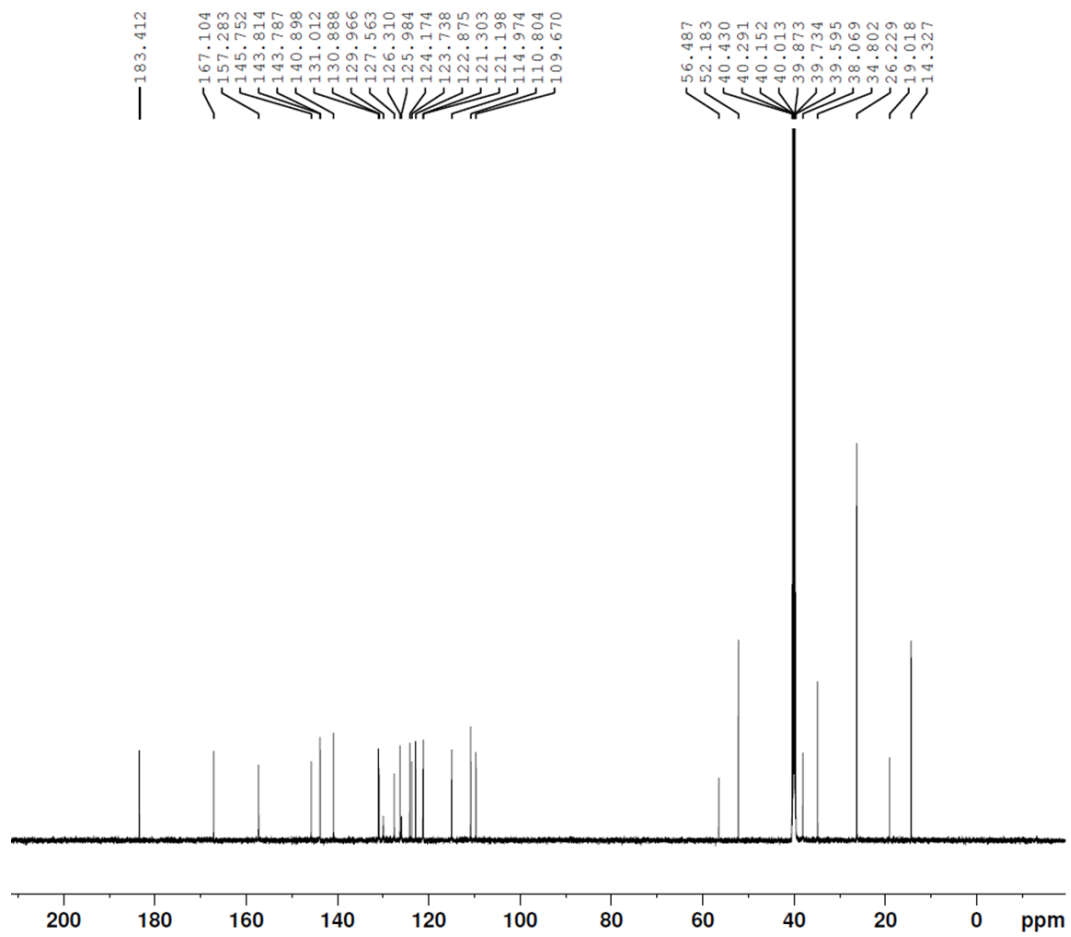
## Supporting Information

### A reaction based carbazole-Indolium conjugate probe for the selective detection of environmentally toxic ions

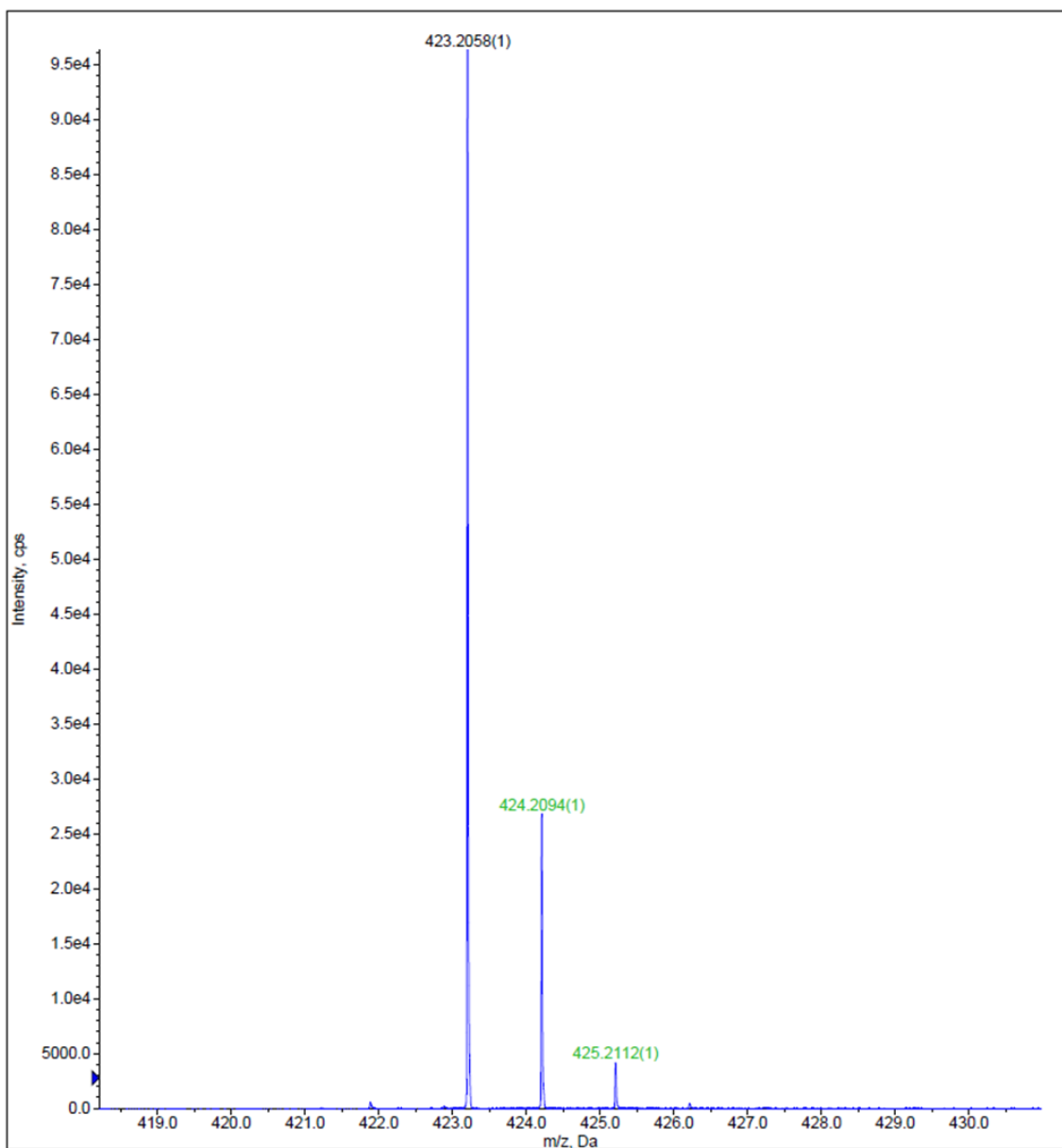
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**Fig. S1.**  $^1\text{H}$  NMR spectrum of **CI**



**Fig. S2.**  $^{13}\text{C}$  NMR spectrum of CI



**Fig. S3.** HRMS spectrum of **CI**

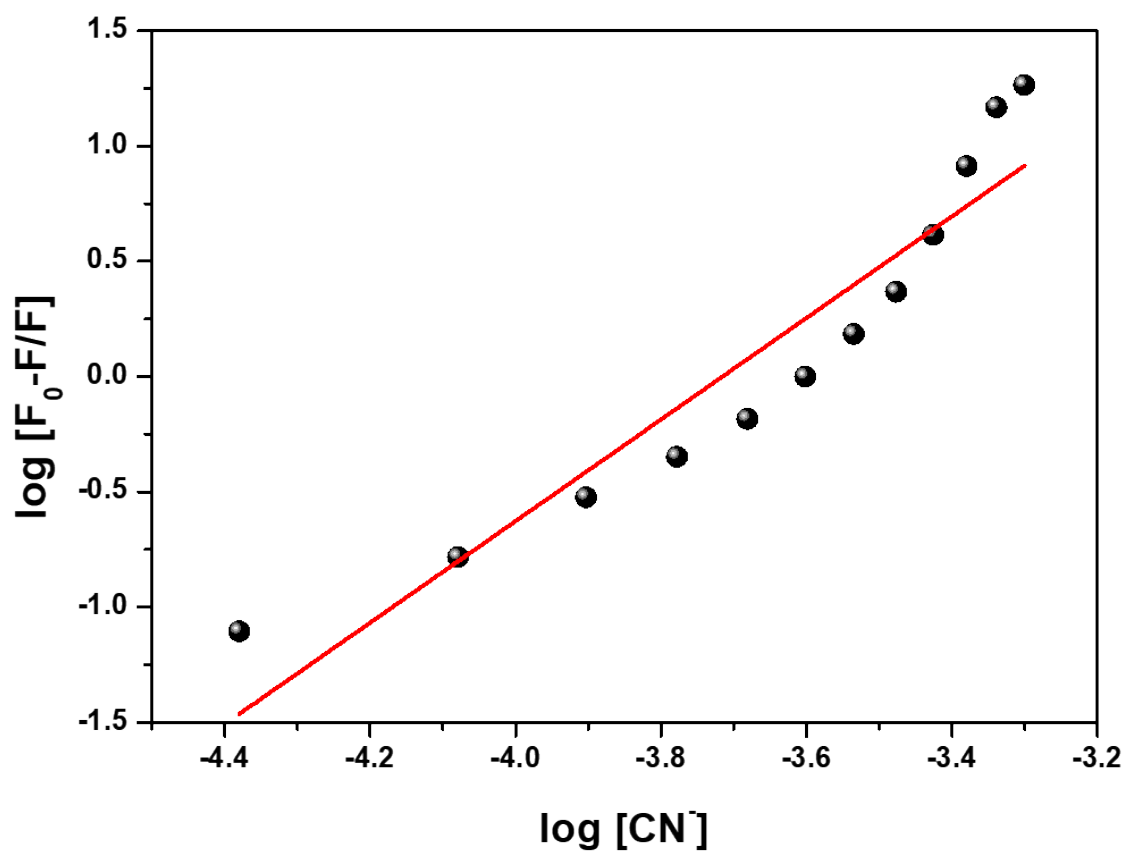


Fig. S4. B-H plot of sensor with cyanide ion

**Table S1.** Comparison of the present work with previously reported work

| <b>S. No</b> | <b>Author's name</b> | <b>Solvent system</b> | <b>Binding constant (M<sup>-1</sup>)</b>       | <b>Detection limit (M)</b>                        | <b>Ref. No.</b> |
|--------------|----------------------|-----------------------|--|---|-----------------|
| 1            | M. S. Sunitha et al. | ACN                   | 3.81x10 <sup>7</sup>                           | 10.39x10 <sup>-5</sup>                            | 10              |
| 2            | S. Malkondu et al.   | 30% aq. DMSO          | 1.99x10 <sup>10</sup>                          | 1.32x10 <sup>-6</sup>                             | 32              |
| 3            | S. B. Roy et al.     | ACN                   | 9.04x10 <sup>2</sup>                           | 0.60x10 <sup>-6</sup>                             | 38              |
| 4            | S. Erdemir et al.    | 10% aq. MeOH          | 1.99x10 <sup>4</sup> &<br>2.45x10 <sup>8</sup> | 0.92 x10 <sup>-6</sup> &<br>0.68x10 <sup>-6</sup> | 39              |
| 5            | M. Gosi et al.       | 80% aq. DMF           | 1.17 x10 <sup>5</sup>                          | 1.80x10 <sup>-8</sup>                             | 40              |
| 6            | Y. Zhuge et al.      | DMSO                  | 2.58x10 <sup>4</sup>                           | 3.82x10 <sup>-6</sup>                             | 41              |
| 7            | M. Sahu et al.       | 33% aq. MeOH          | 4.99x10 <sup>4</sup>                           | 0.89x10 <sup>-6</sup>                             | 42              |
| 8            | J. Hwang et al.      | THF                   | 3.02x10 <sup>4</sup> &<br>4.85x10 <sup>5</sup> | 8.9 x10 <sup>-7</sup> &<br>3.14x10 <sup>-8</sup>  | 43              |
| 9            | B. K. Bakht et al.   | DMF                   | 2x10 <sup>6</sup>                              | 0.7x10 <sup>-6</sup>                              | 44              |
| 10           | P. Jayasudha et al.  | 90% aq. DMSO          | 1.38x10 <sup>8</sup>                           | 0.14x10 <sup>-6</sup>                             | Present work    |

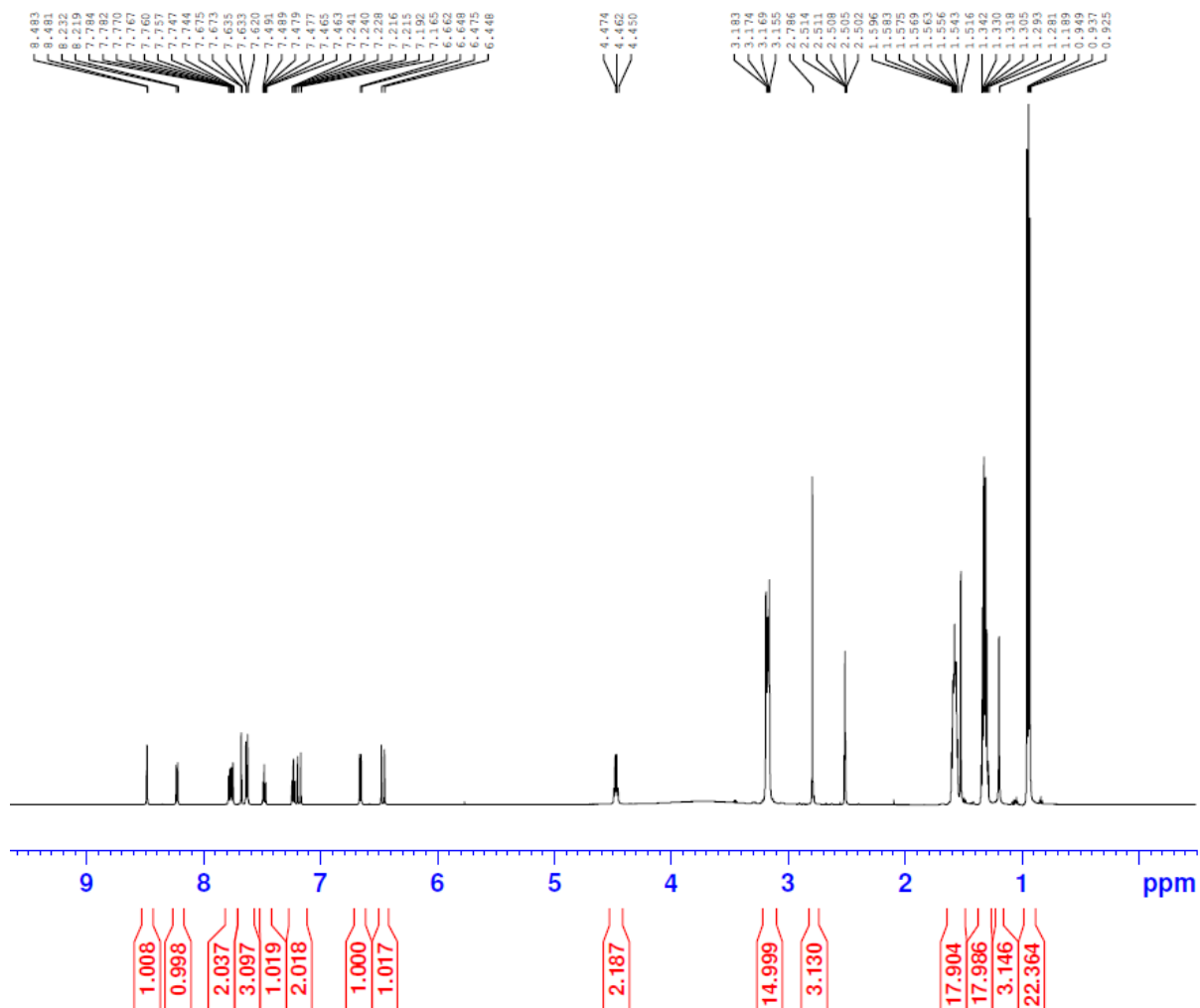
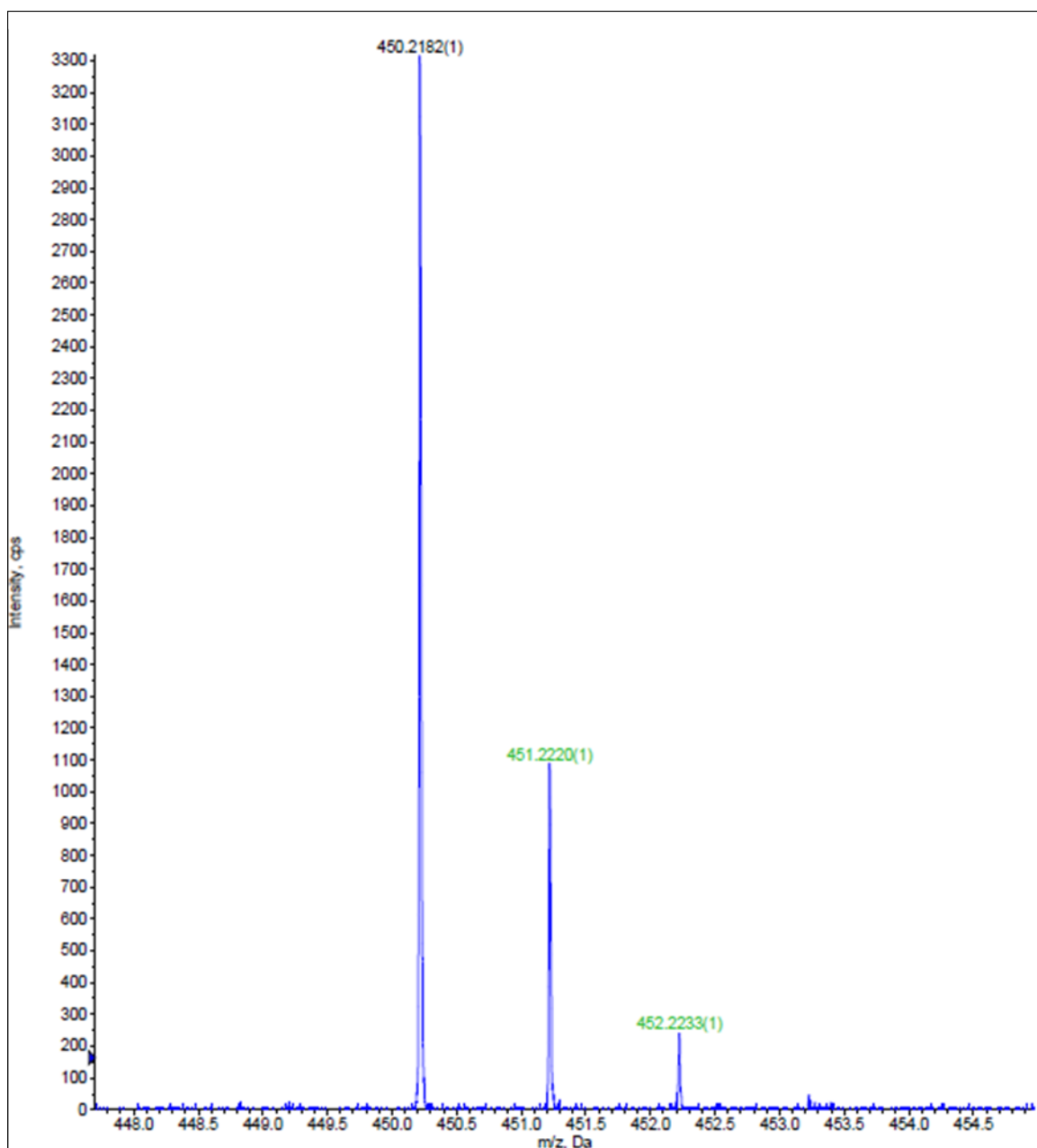


Fig. S5.  $^1\text{H}$  NMR spectrum of  $\text{CI}+\text{CN}^-$  adduct



**Fig. S6.** HRMS spectrum of  $\text{CI}+\text{CN}^-$  adduct