

Supplementary Information

One-Pot Four-Component Synthesis of 2-Aryl-3,3-Dihaloacrylonitriles using Potassium Hexacyanoferrate(II) as Environmentally Benign Cyanide Source

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The IR, ¹H MNR and ¹³C MNR spectra for products are given below:

2-Phenyl-3,3-dichloroacrylonitrile (**1a**)

IR (KBr) ν_{max} /cm⁻¹: 3061, 2922, 2223, 1563, 1445, 930, 824, 759, 695; ¹H NMR (CDCl₃, 400 MHz): δ 7.52-7.41 (m, 5H, Ph-H), ¹³C NMR (CDCl₃, 100MHz): δ 137.1, 130.6, 130.0, 128.8, 128.6, 115.5, 108.2.

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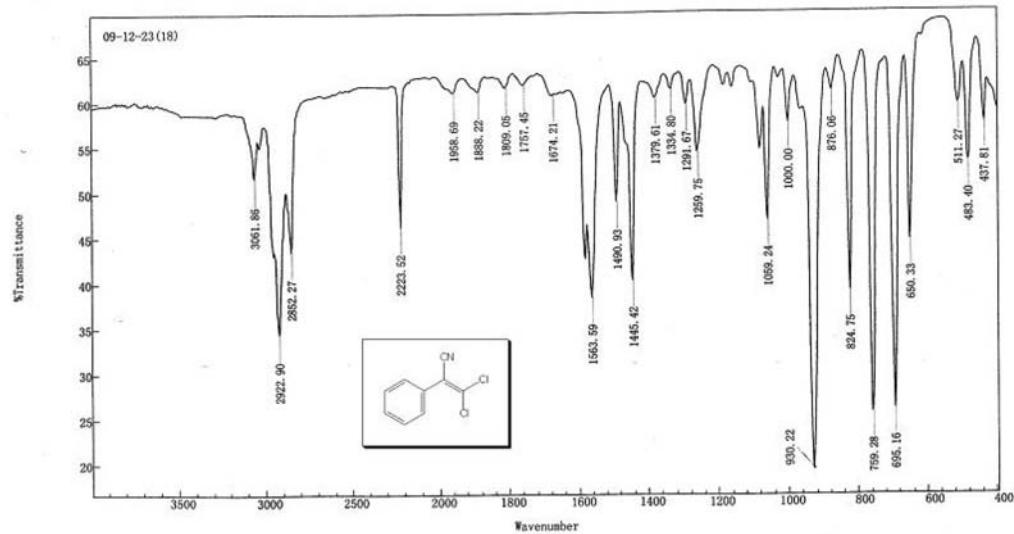


Figure S1. IR spectrum of 2-phenyl-3,3-dichloroacrylonitrile (**1a**).

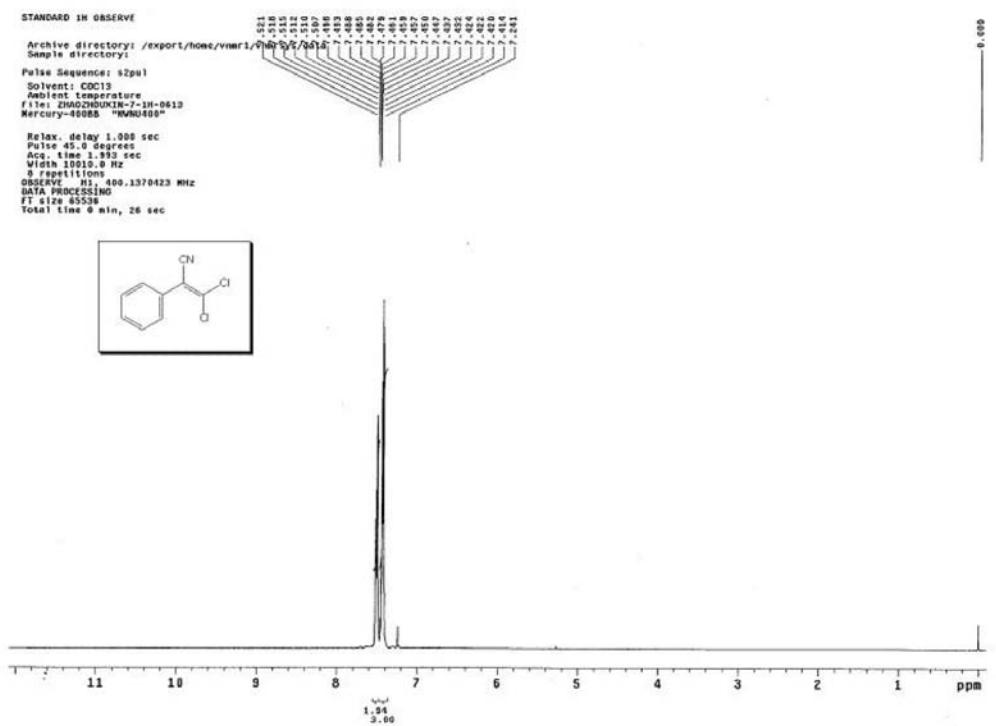


Figure S2 ¹H NMR spectrum of 2-phenyl-3,3-dichloroacrylonitrile (**1a**)

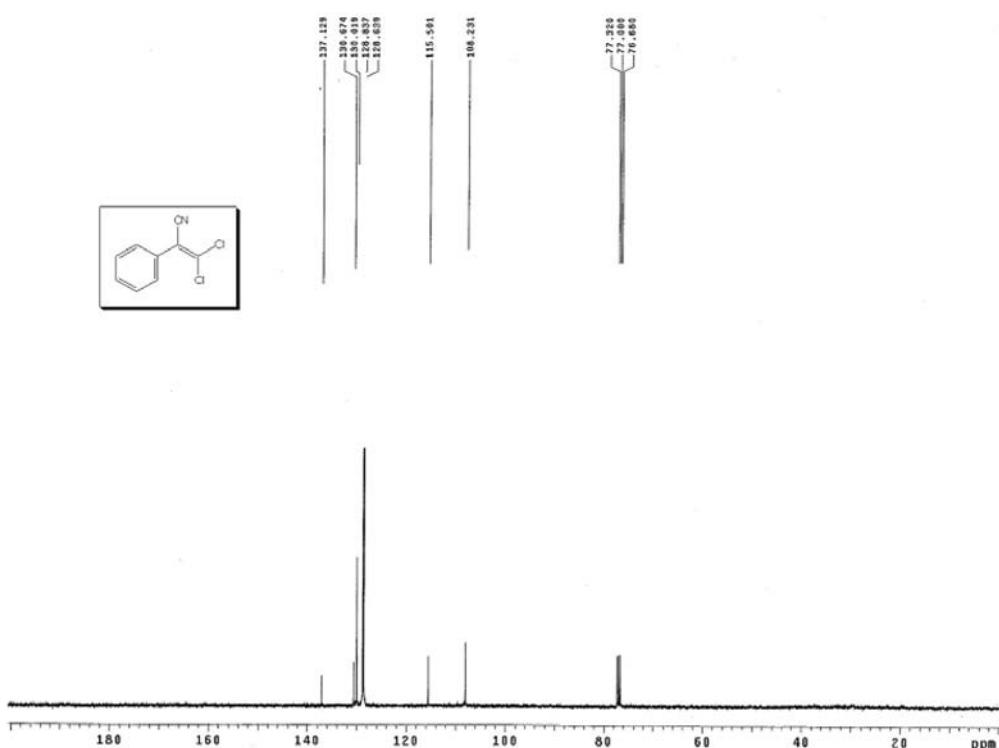


Figure S3. ¹³C NMR spectrum of 2-phenyl-3,3-dichloroacrylonitrile (**1a**).

2-(2-Chlorophenyl)-3,3-dichloroacrylonitrile (1b**)**

IR (KBr) ν_{max} /cm⁻¹: 3042, 2999, 2219, 1604, 1510, 1256, 927, 825; ¹H NMR (CDCl₃, 400 MHz): δ 7.60-7.31 (m, 4H, Ph-H), ¹³C NMR (CDCl₃, 100 MHz): δ 132.9, 132.4, 131.5, 130.4, 130.2, 127.4, 120.4, 115.6, 113.9.

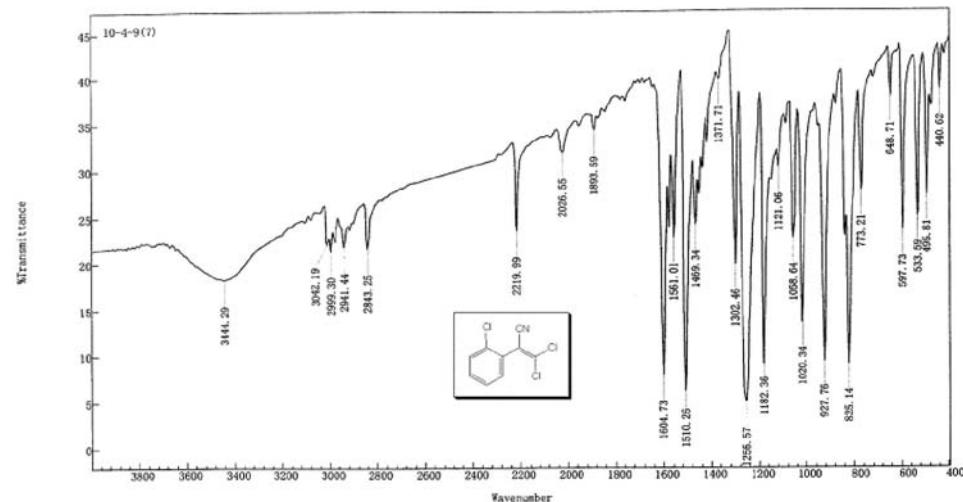
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Figure S4. IR spectrum of 2-(2-chlorophenyl)-3,3-dichloroacrylonitrile (**1b**).

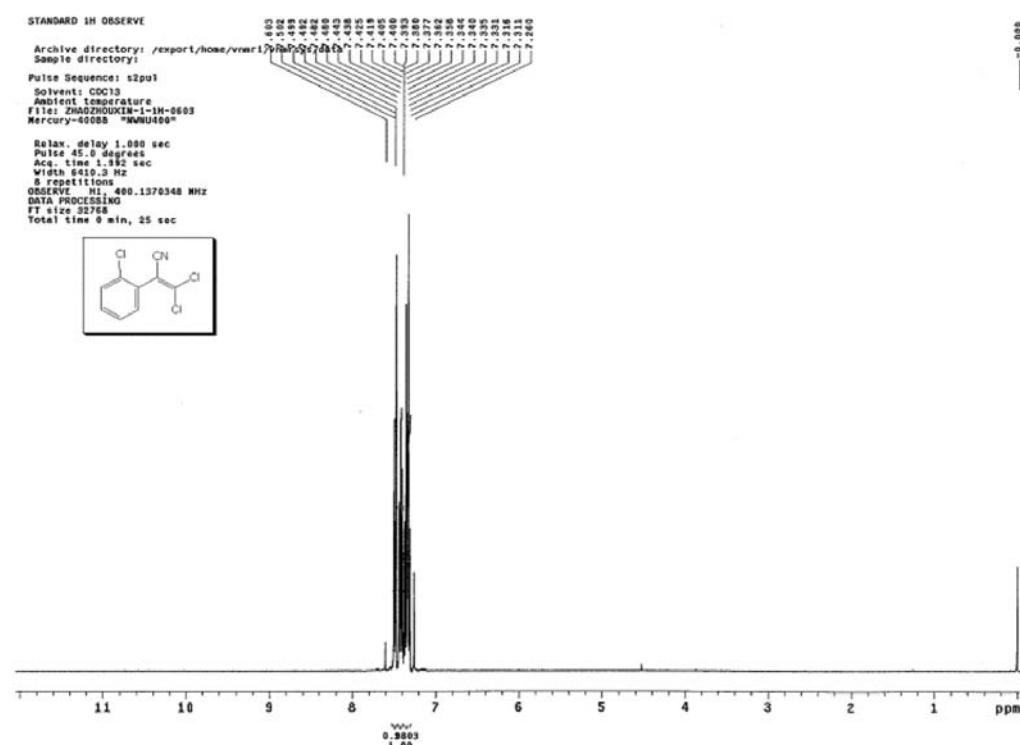


Figure S5. ¹H NMR spectrum of 2-(2-chlorophenyl)-3,3-dichloroacrylonitrile (**1b**).

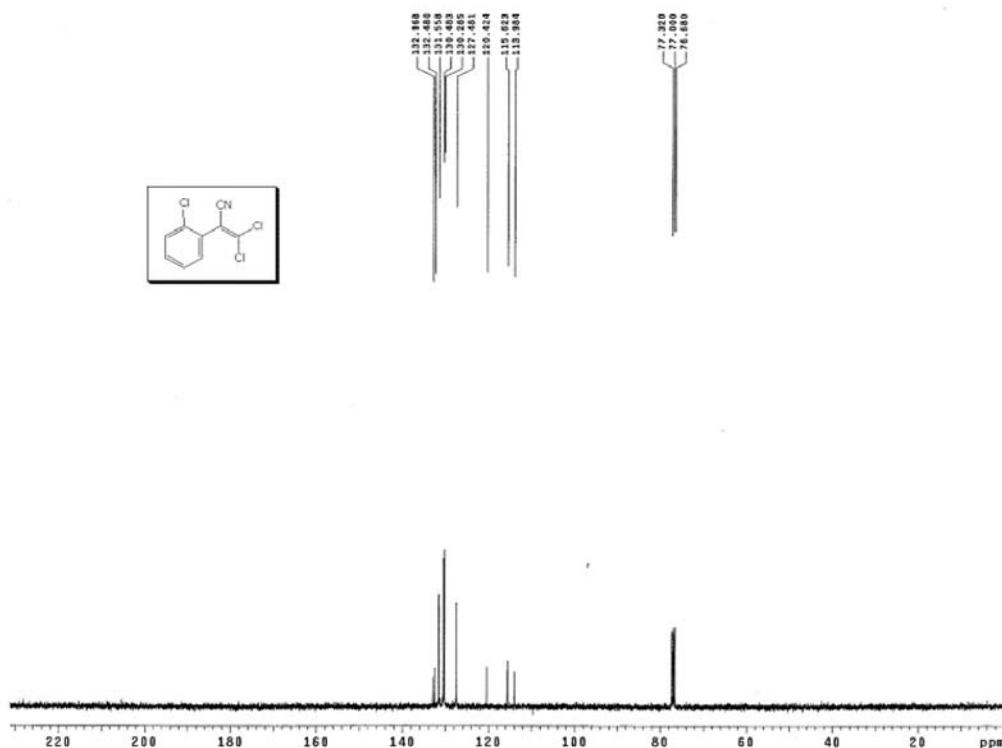


Figure S6. ^{13}C NMR spectrum of 2-(2-chlorophenyl)-3,3-dichloroacrylonitrile (**1b**).

2-(3-Chlorophenyl)-3,3-dichloroacrylonitrile (**1c**)

IR (KBr) ν_{max} /cm⁻¹: 3062, 2926, 2220, 1571, 1471, 1262, 943, 850; ^1H NMR (CDCl₃, 400 MHz): δ 7.52 (s, 1H, Ph-H), 7.44-7.39 (m, 3H, Ph-H); ^{13}C NMR (CDCl₃, 100 MHz): δ 138.6, 134.9, 132.2, 130.3, 130.2, 128.8, 126.9, 115.1, 114.3.

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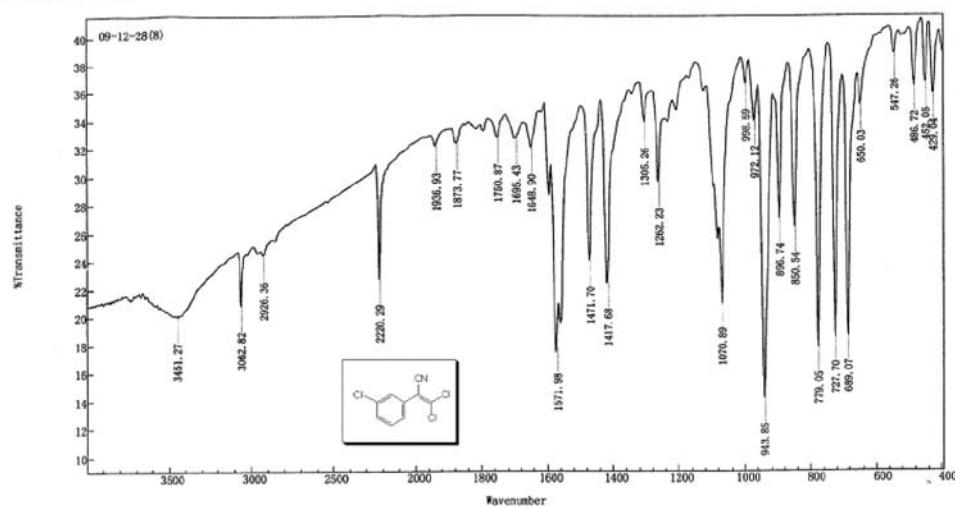


Figure S7. IR spectrum of 2-(3-chlorophenyl)-3,3-dichloroacrylonitrile (**1c**).

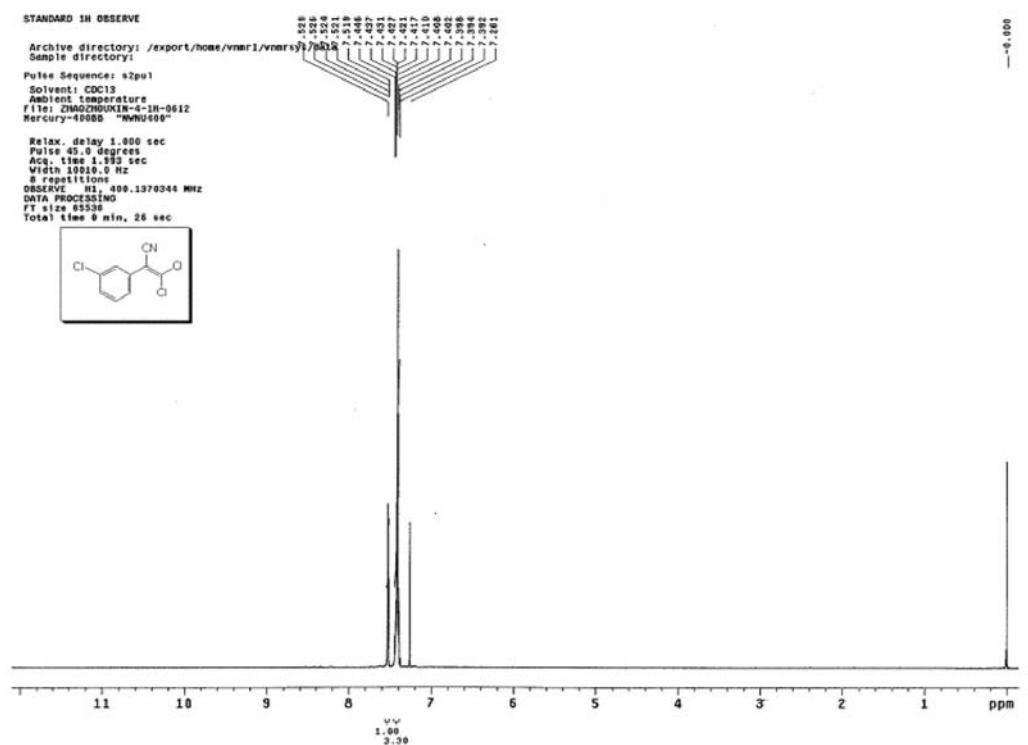


Figure S8. ^1H NMR spectrum of 2-(3-chlorophenyl)-3,3-dichloroacrylonitrile (**1c**).

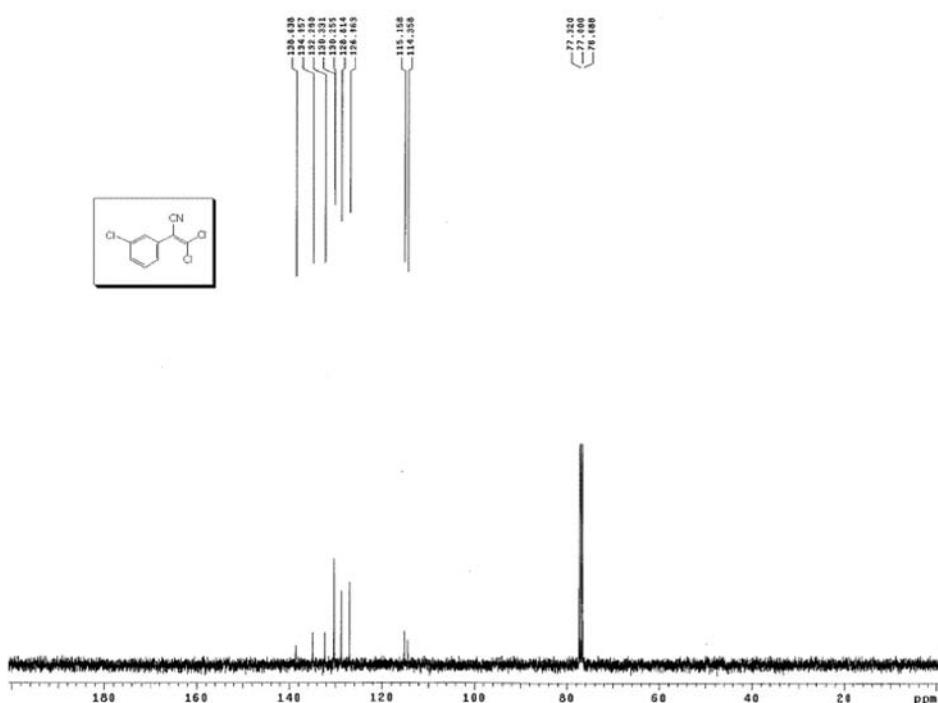


Figure S9. ^{13}C NMR spectrum of 2-(3-chlorophenyl)-3,3-dichloroacrylonitrile (**1c**).

2-(4-Chlorophenyl)-3,3-dichloroacrylonitrile (1d**)**

IR (KBr) ν_{max} /cm⁻¹: 3084, 2924, 2220, 1555, 1481, 1279, 927, 809; ¹H NMR (CDCl₃, 400 MHz): δ 7.48-7.40 (m, 4H, Ph-H); ¹³C NMR (CDCl₃, 100 MHz): δ 137.7, 136.2, 130.0, 129.1, 129.0, 115.2, 114.5.

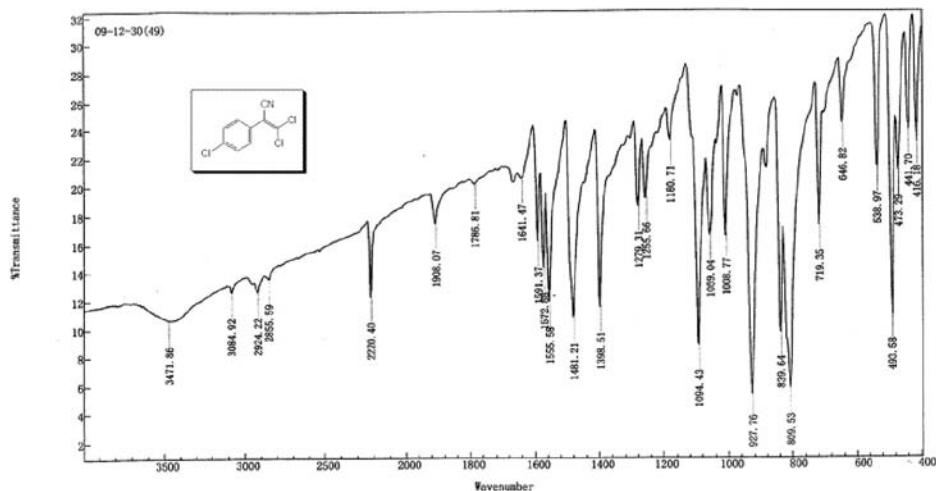
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Figure S10. IR spectrum of 2-(4-chlorophenyl)-3,3-dichloroacrylonitrile (**1d**).

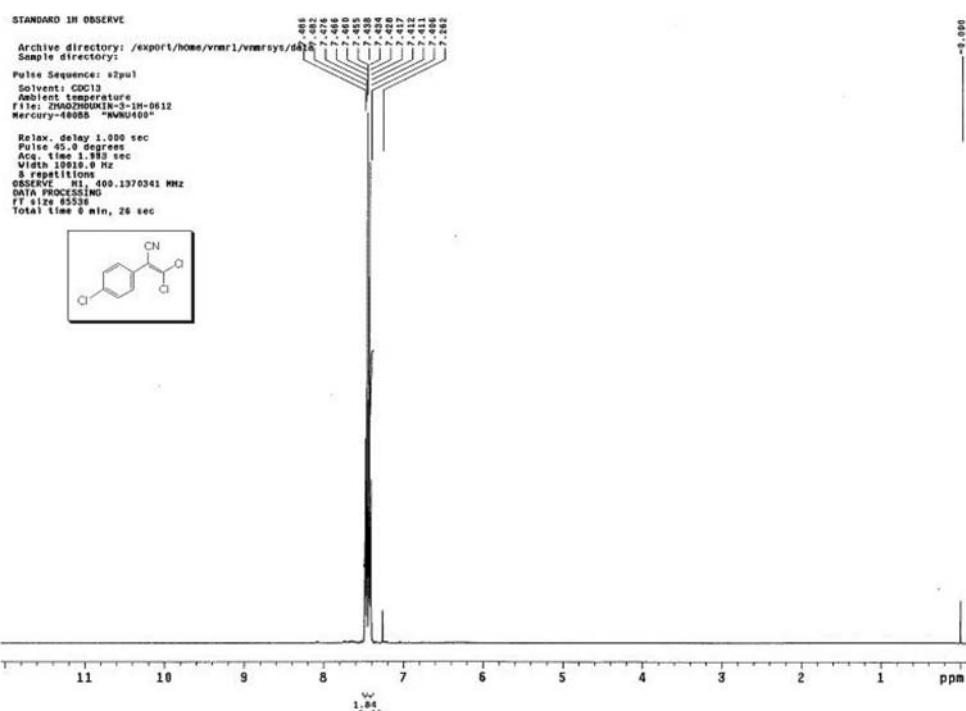


Figure S11. ¹H NMR spectrum of 2-(4-chlorophenyl)-3,3-dichloroacrylonitrile (**1d**).

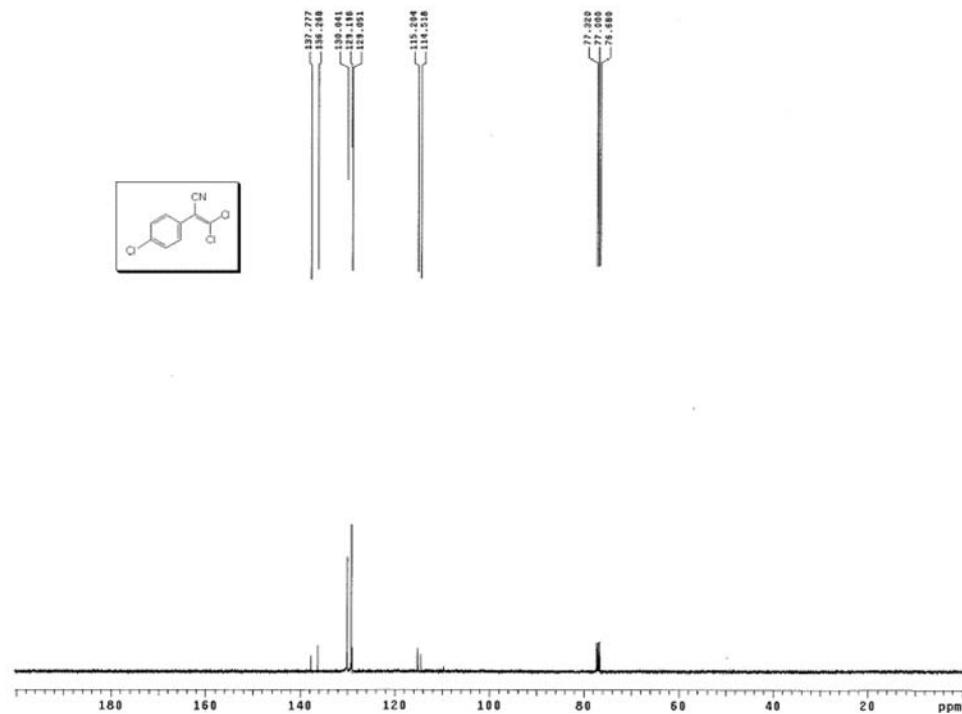


Figure S12. ¹³C NMR spectrum of 2-(4-chlorophenyl)-3,3-dichloroacrylonitrile (**1d**).

2-(2-Methylphenyl)-3,3-dichloroacrylonitrile (**1e**)

IR (KBr) ν_{max} /cm⁻¹: 3067, 2925, 2219, 1571, 1485, 1258, 930, 753; ¹H NMR (CDCl₃, 400 MHz): δ 7.22-7.00 (m, 4H, Ph-H), 2.16 (s, 3H, CH₃); ¹³C NMR (CDCl₃, 100 MHz): δ 138.5, 136.1, 130.4, 130.0, 129.9, 128.7, 126.2, 114.7, 114.2, 18.8.

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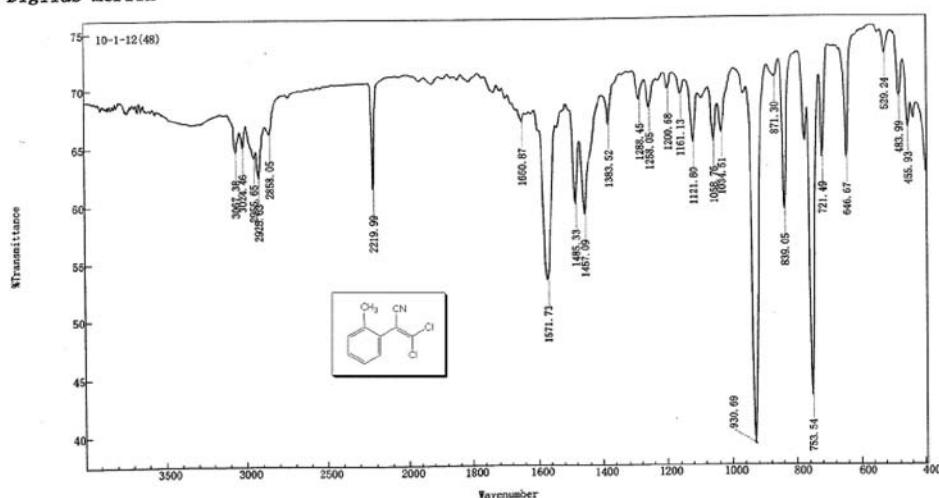


Figure S13. IR spectrum of 2-(2-methylphenyl)-3,3-dichloroacrylonitrile (**1e**).

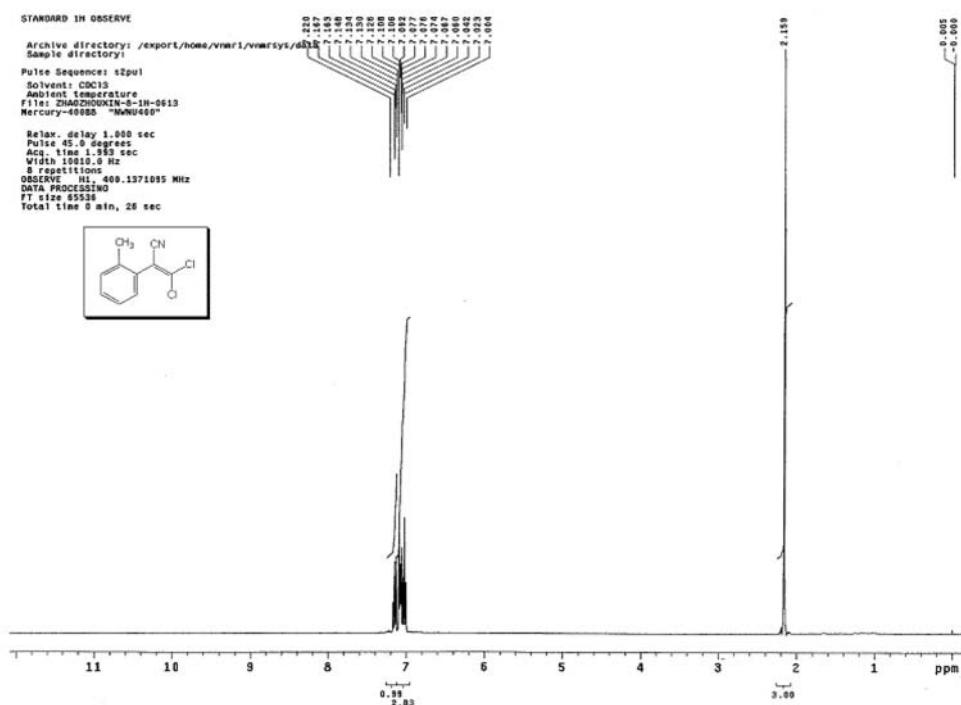


Figure S14. ¹H NMR spectrum of 2-(2-methylphenyl)-3,3-dichloroacrylonitrile (**1e**).

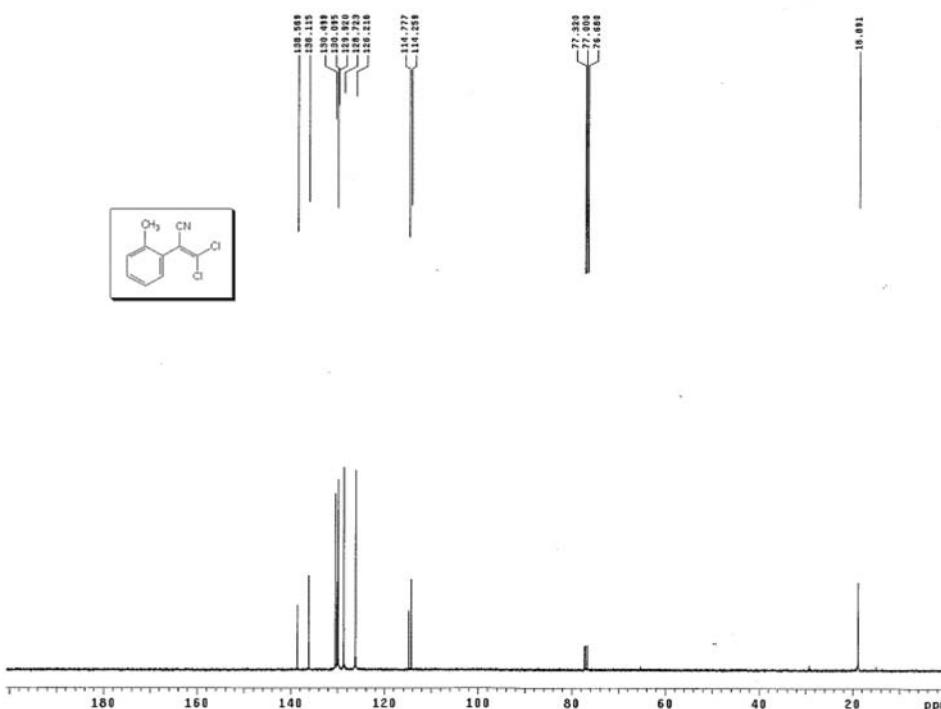


Figure S14. ¹³C NMR spectrum of 2-(2-methylphenyl)-3,3-dichloroacrylonitrile (**1e**).

2-(3-Methylphenyl)-3,3-dichloroacrylonitrile (1f**)**

IR (KBr) ν_{max} /cm⁻¹: 3039, 2923, 2222, 1565, 1485, 1267, 931, 877, 791, 697; ¹H NMR (CDCl₃, 400 MHz): δ 7.28-7.20 (m, 4H, Ar-H), 2.35 (s, 3H, CH₃); ¹³C NMR (CDCl₃, 100 MHz): δ 138.5, 136.6, 130.6, 130.4, 128.9, 128.5, 125.5, 115.5, 115.4, 21.0.

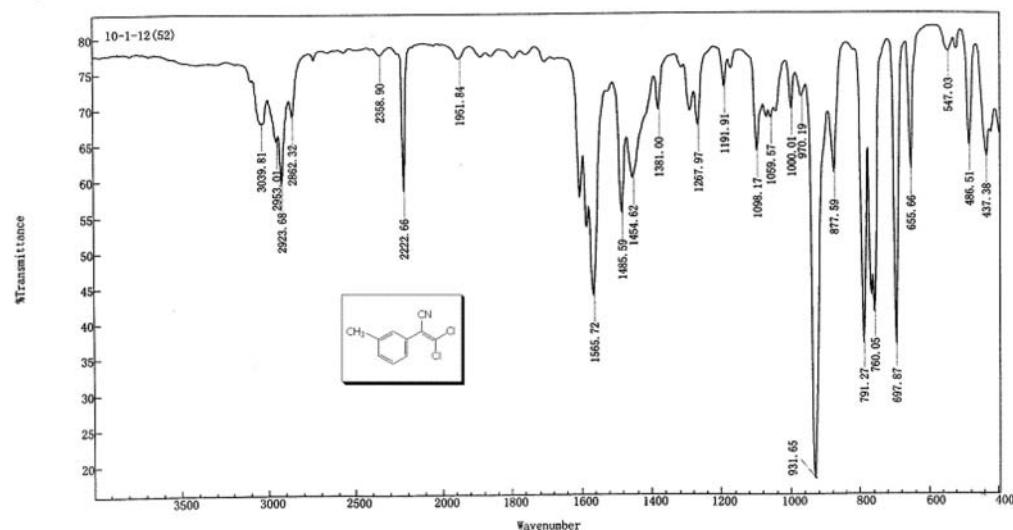
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Figure S16. IR spectrum of 2-(3-methylphenyl)-3,3-dichloroacrylonitrile (**1f**).

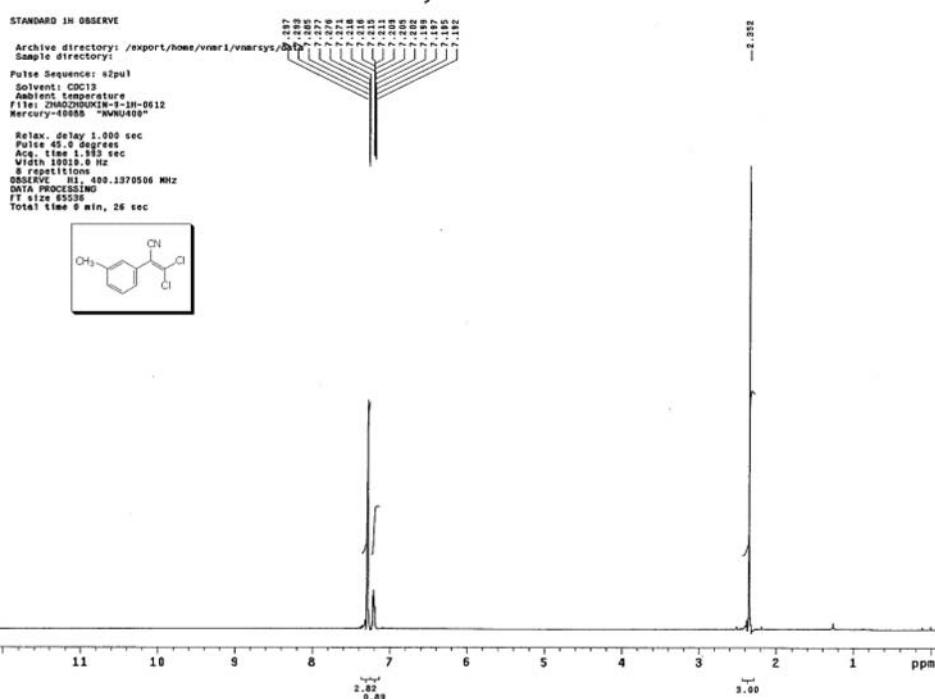


Figure S17. ¹H NMR spectrum of 2-(3-methylphenyl)-3,3-dichloroacrylonitrile (**1f**).

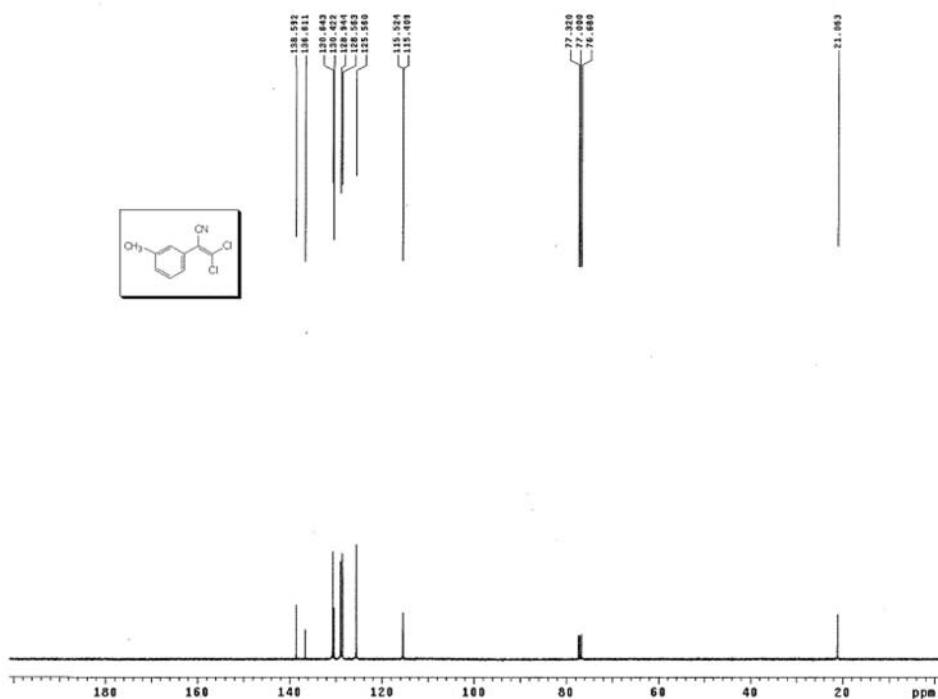


Figure S18. ^{13}C NMR spectrum of 2-(3-methylphenyl)-3,3-dichloroacrylonitrile (**1f**).

2-(4-Methylphenyl)-3,3-dichloroacrylonitrile (**1g**)

IR (KBr) ν_{max} /cm $^{-1}$: 3031, 2923, 2222, 1573, 1509, 1258, 929, 815, 771; ^1H NMR (CDCl_3 , 400 MHz): δ 7.37 (d, 2H, J 8.4 Hz, Ar-H), 7.19 (d, 2H, J 8.4 Hz, Ar-H), 2.32 (s, 3H, CH_3); ^{13}C NMR (CDCl_3 , 100MHz): δ 140.0, 135.7, 129.2, 128.2, 127.4, 115.3, 115.2, 20.9.

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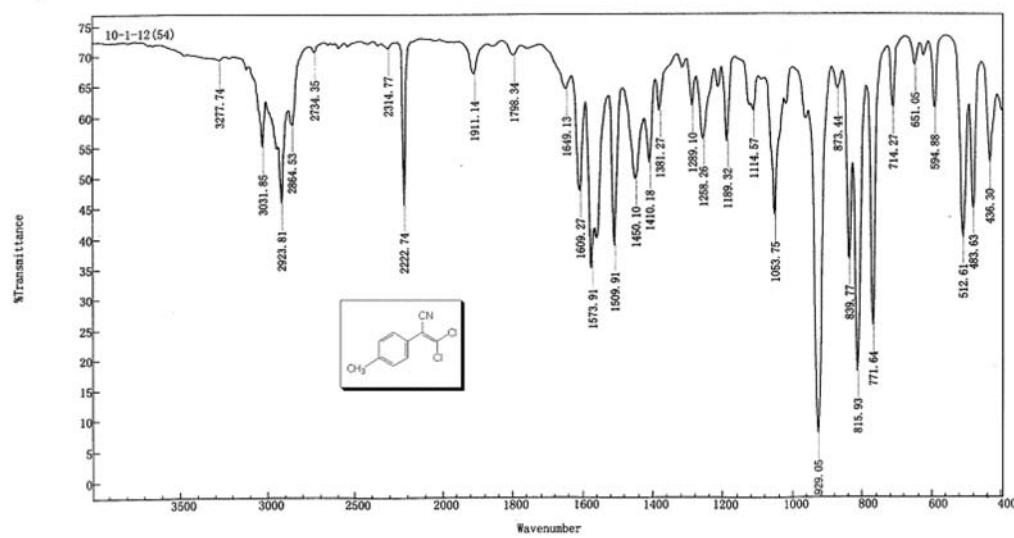


Figure S19. IR spectrum of 2-(4-methylphenyl)-3,3-dichloroacrylonitrile (**1g**).

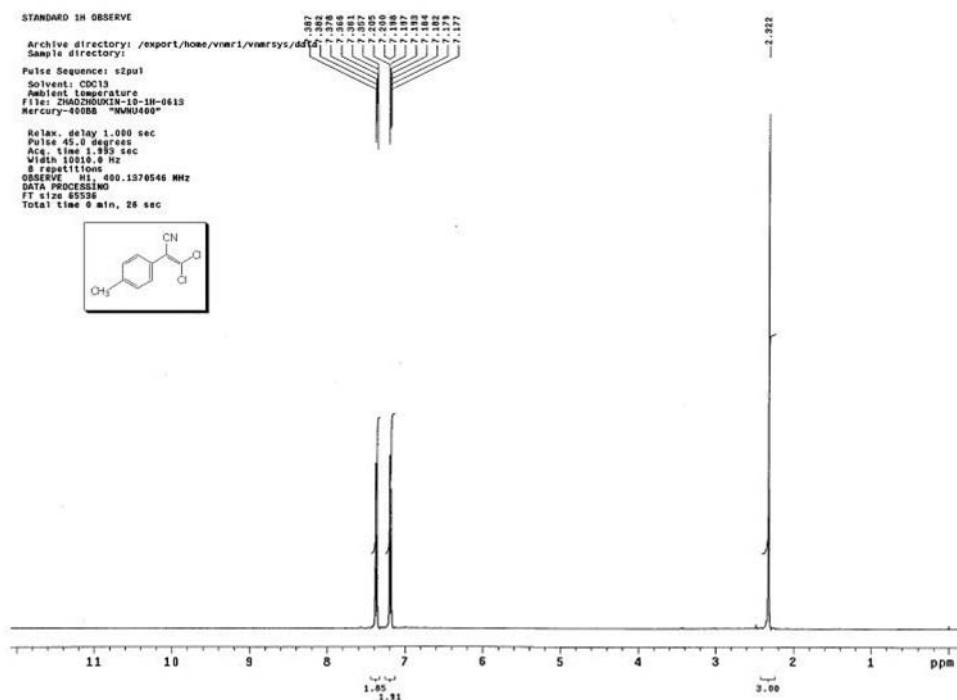


Figure S20. ^1H NMR spectrum of 2-(4-methylphenyl)-3,3-dichloroacrylonitrile (**1g**).

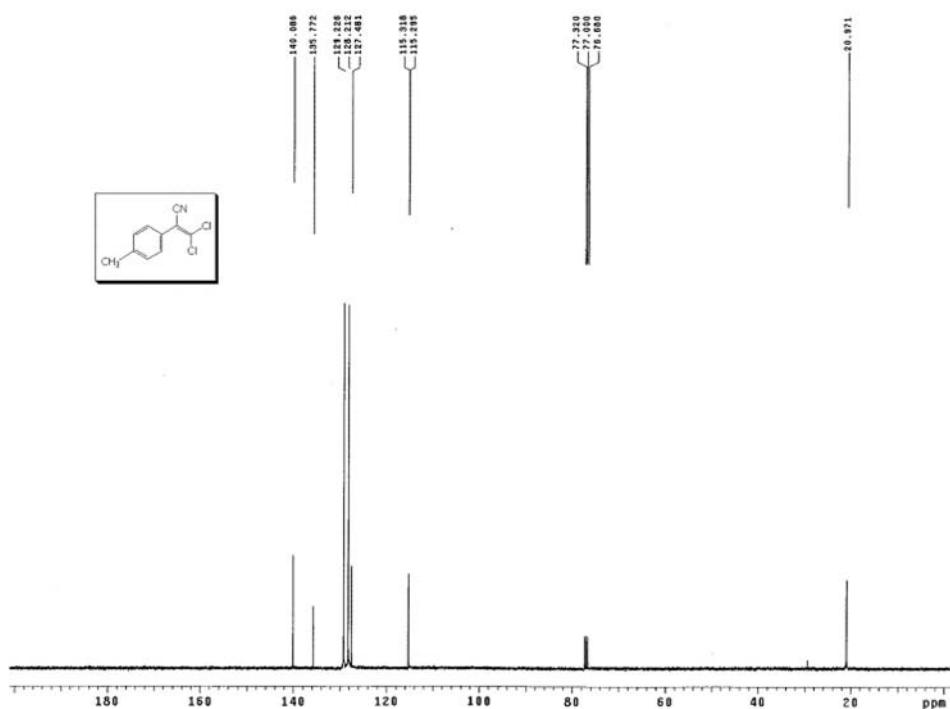


Figure S21. ^{13}C NMR spectrum of 2-(4-methylphenyl)-3,3-dichloroacrylonitrile (**1g**).

2-(2-Ethylphenyl)-3,3-dichloroacrylonitrile (1h**)**

IR (KBr) ν_{max} /cm⁻¹: 3032, 2918, 2224, 1589, 1497, 1234, 942, 842; ¹H NMR (CDCl₃, 400 MHz): δ 7.25-6.97 (m, 4H, Ar-H), 2.88 (q, 2H, *J* 6.4 Hz, CH₂), 1.26 (t, 3H, *J* 6.4 Hz, CH₃); ¹³C NMR (CDCl₃, 100 MHz): δ 143.1, 129.1, 129.0, 128.8, 124.7, 124.1, 121.6, 120.3, 119.2, 25.6, 14.3.

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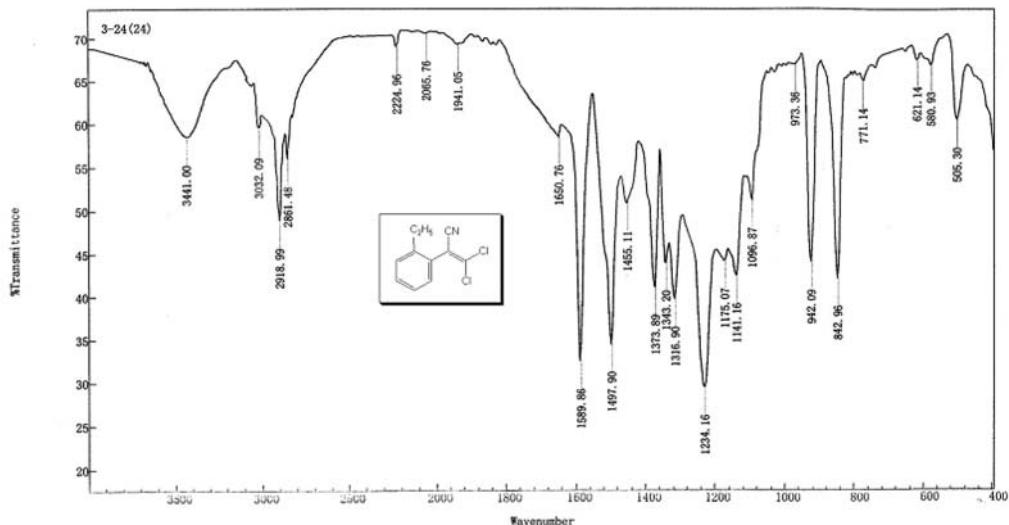


Figure S22. IR spectrum of 2-(2-ethylphenyl)-3,3-dichloroacrylonitrile (**1h**).

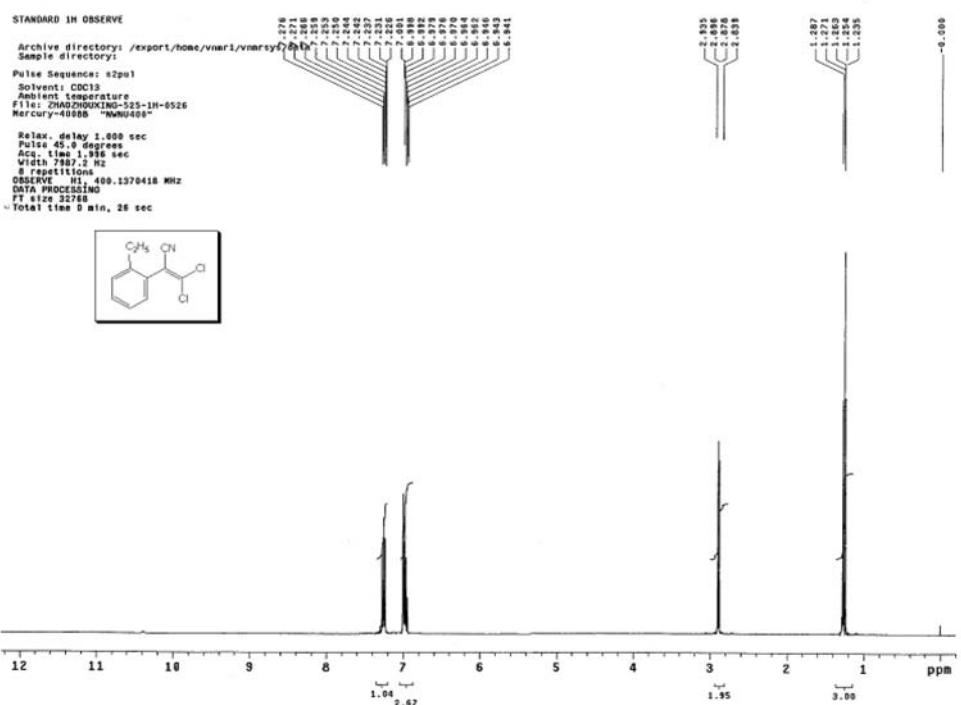


Figure S23. ^1H NMR spectrum of 2-(2-ethylphenyl)-3,3-dichloroacrylonitrile (**1h**).

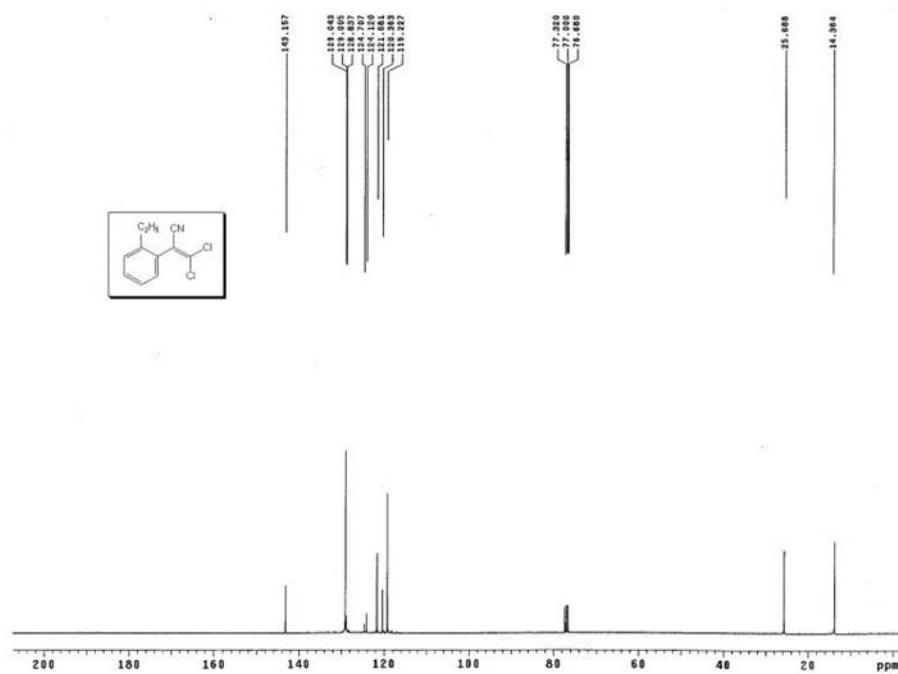


Figure S24. ¹³C NMR spectrum of 2-(2-ethylphenyl)-3,3-dichloroacrylonitrile (**1h**).

2-(3-Nitrophenyl)-3,3-dichloroacrylonitrile (**Ii**)

IR (KBr) ν_{max} /cm⁻¹: 3081, 2924, 2223, 1614, 1532, 1348, 1263, 947; ¹H NMR (CDCl₃, 400 MHz): δ 8.45 (s, 1H, Ar-H), 8.33 (d, 1H, J 8.0 Hz, Ar-H), 7.87 (d, 1H, J 8.0 Hz, Ar-H), 7.70 (t, 1H, J 8.0 Hz, Ar-H); ¹³C NMR (CDCl₃, 100 MHz): δ 148.2, 140.1, 134.6, 132.2, 130.2, 124.9, 123.9, 114.7, 113.4.

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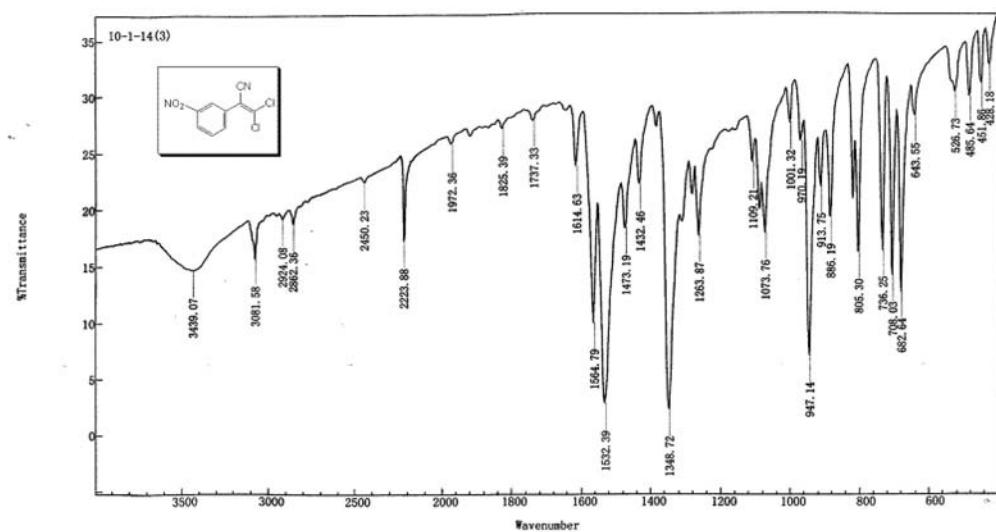


Figure S25. IR spectrum of 2-(3-nitrophenyl)-3,3-dichloroacrylonitrile (**Ii**).

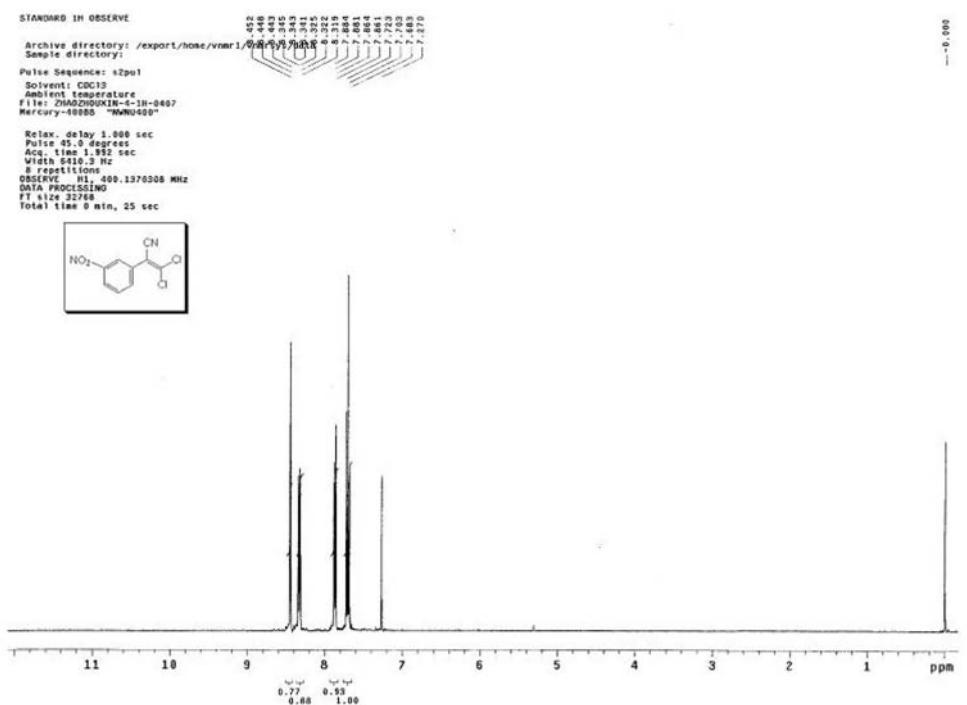


Figure S26. ^1H NMR spectrum of 2-(3-nitrophenyl)-3,3-dichloroacrylonitrile (**1i**).

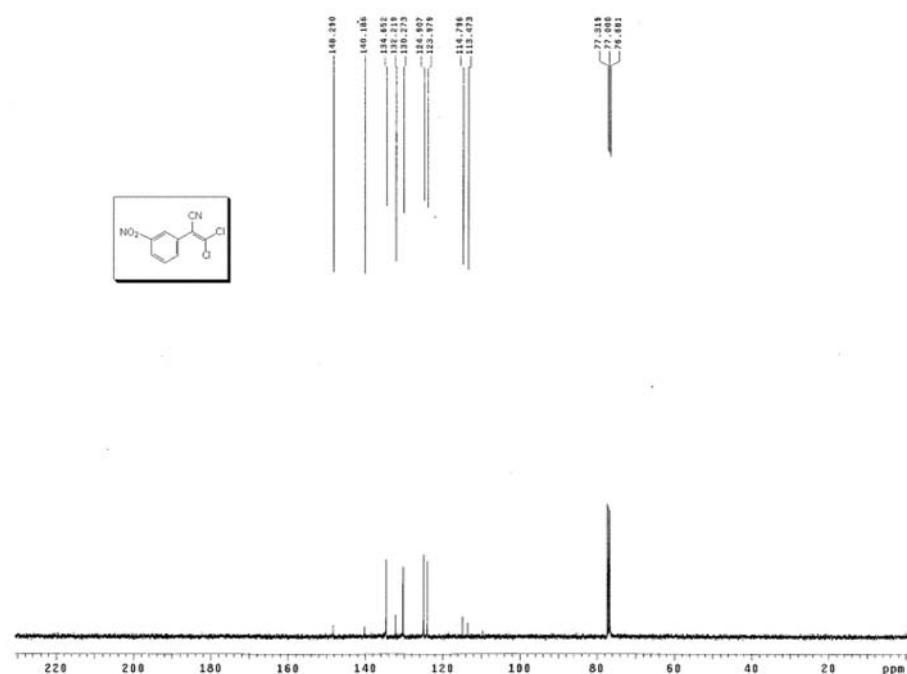


Figure S27. ^{13}C NMR spectrum of 2-(3-nitrophenyl)-3,3-dichloroacrylonitrile (**1i**).

2-(4-Nitrophenyl)-3,3-dichloroacrylonitrile (Ij**)**

IR (KBr) ν_{max} /cm⁻¹: 3049, 2923, 2235, 1555, 1481, 1377, 1226, 1024, 939, 748; ¹H NMR (CDCl₃, 400 MHz): δ 8.33 (d, *J* 9.2 Hz, 2H, Ar-H), 7.74 (d, 2H, *J* 9.2 Hz, Ar-H); ¹³C NMR (CDCl₃, 100 MHz): δ 148.3, 140.2, 136.7, 130.0, 124.1, 114.7, 113.8.

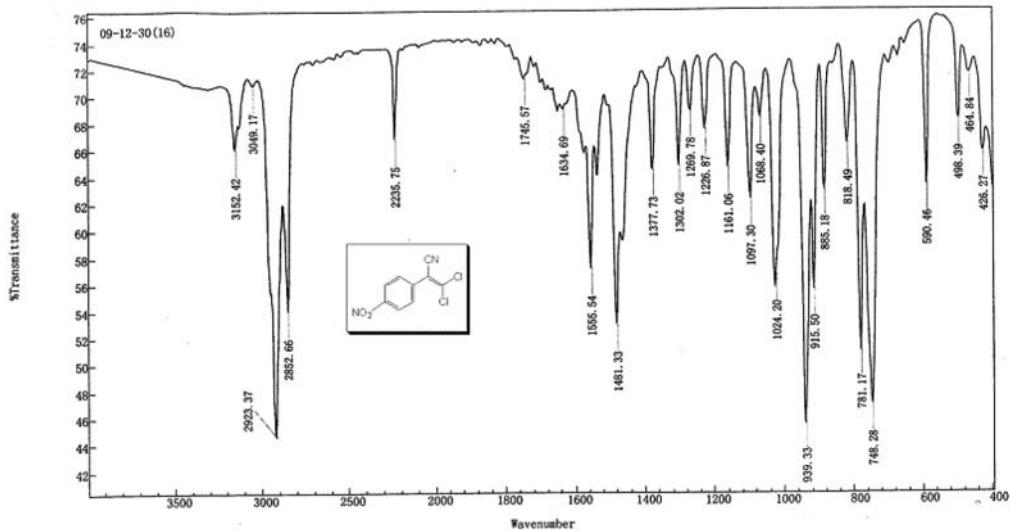
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Figure S28. IR spectrum of 2-(4-nitrophenyl)-3,3-dichloroacrylonitrile (**Ij**).

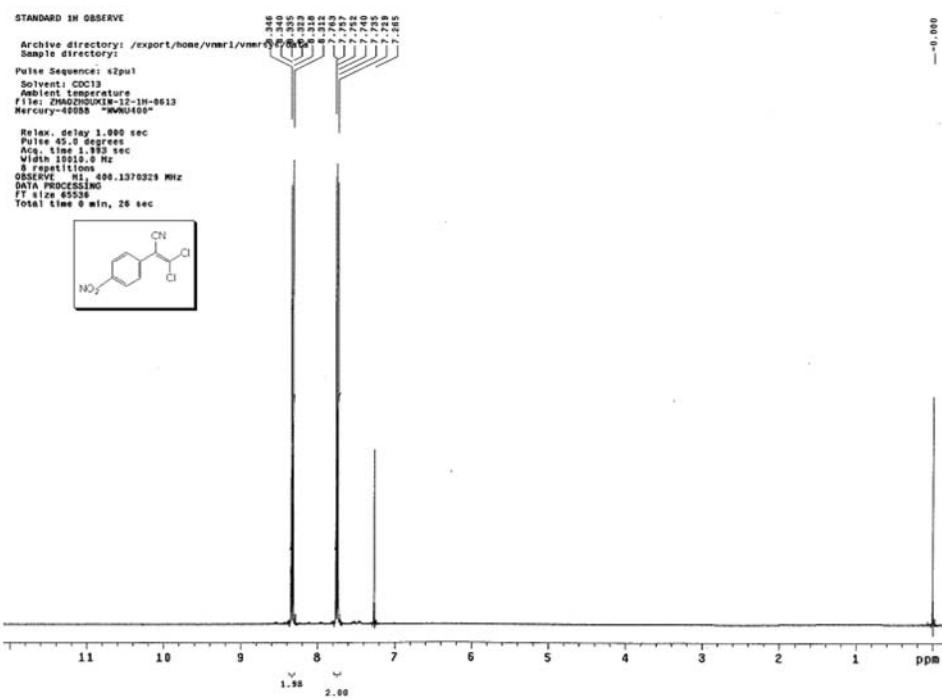


Figure S29. ¹H NMR spectrum of 2-(4-nitrophenyl)-3,3-dichloroacrylonitrile (**Ij**).

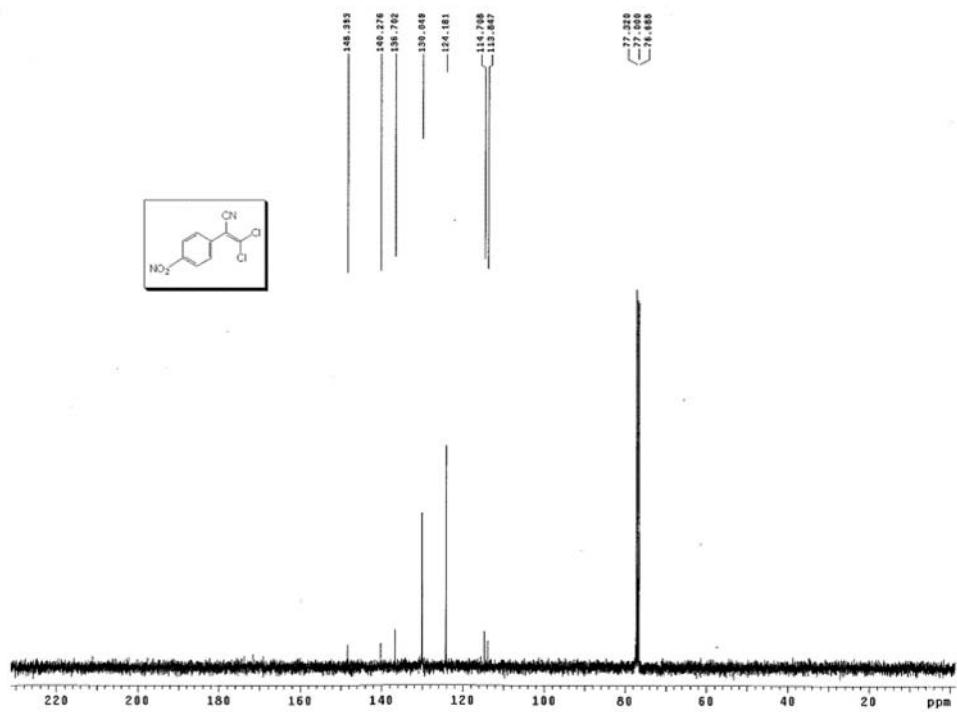


Figure S30. ¹³C NMR spectrum of 2-(4-nitrophenyl)-3,3-dichloroacrylonitrile (**1j**).

2-(4-Ethoxyphenyl)-3,3-dichloroacrylonitrile (**1k**)

IR (KBr) ν_{max} /cm⁻¹: 3059, 2988, 2218, 1606, 1510, 1265, 924; ¹H NMR (CDCl₃, 400 MHz): δ 7.46 (d, 2H, *J* 8.8 Hz, Ar-H), 6.93 (d, 2H, *J* 8.8 Hz, Ar-H), 4.06 (q, 2H, *J* 6.8 Hz, CH₂), 1.43 (t, 3H, *J* 6.8 Hz, CH₃); ¹³C NMR (CDCl₃, 100 MHz): δ 160.0, 135.3, 130.2, 122.6, 115.8, 115.2, 114.6, 63.6, 14.6.

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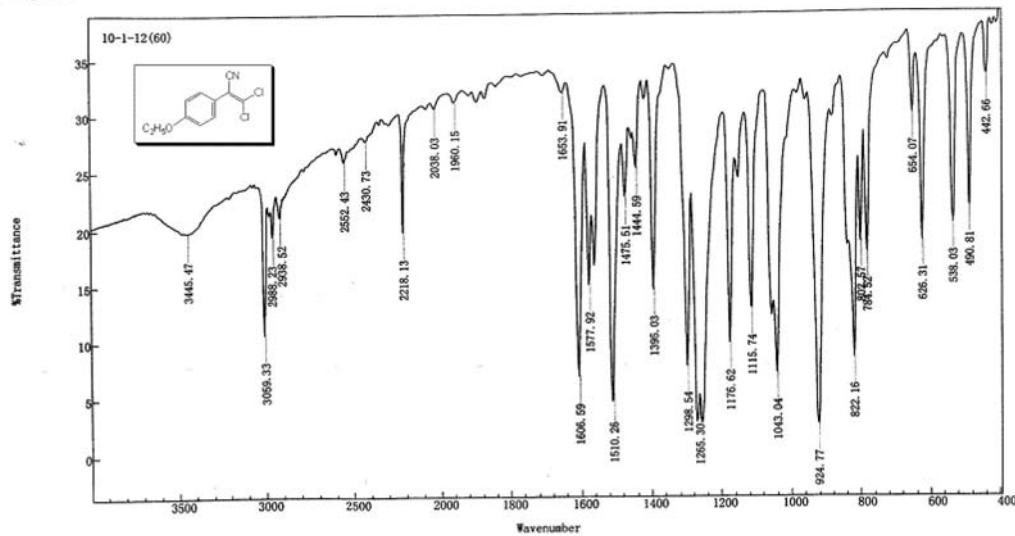


Figure S31. IR spectrum of 2-(4-ethoxyphenyl)-3,3-dichloroacrylonitrile (**1k**).

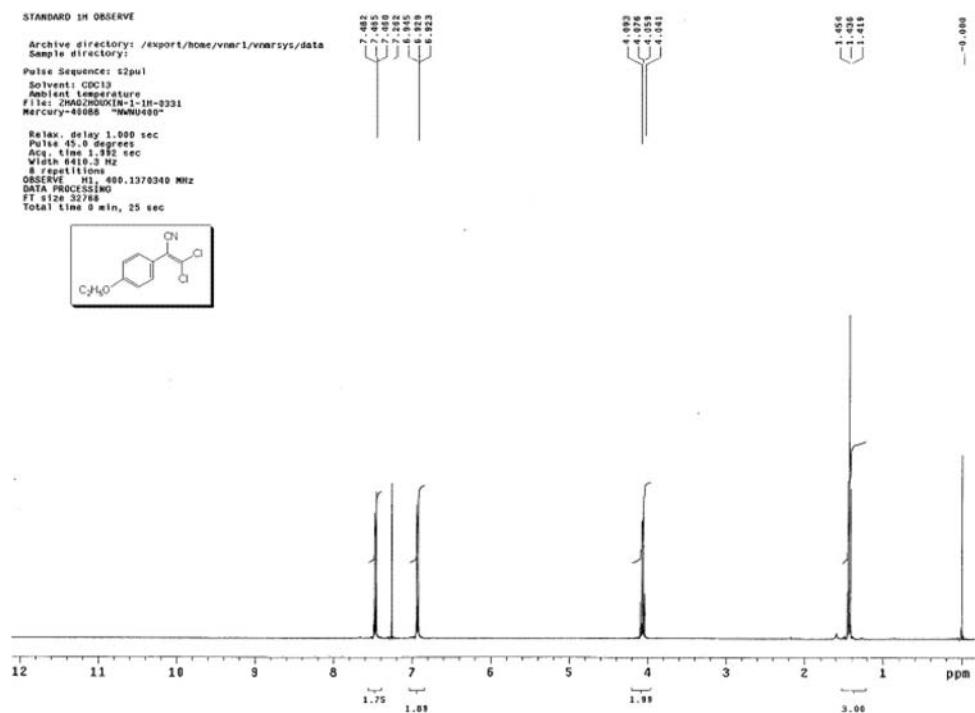


Figure S32. ¹H NMR spectrum of 2-(4-ethoxyphenyl)-3,3-dichloroacrylonitrile (**1k**).

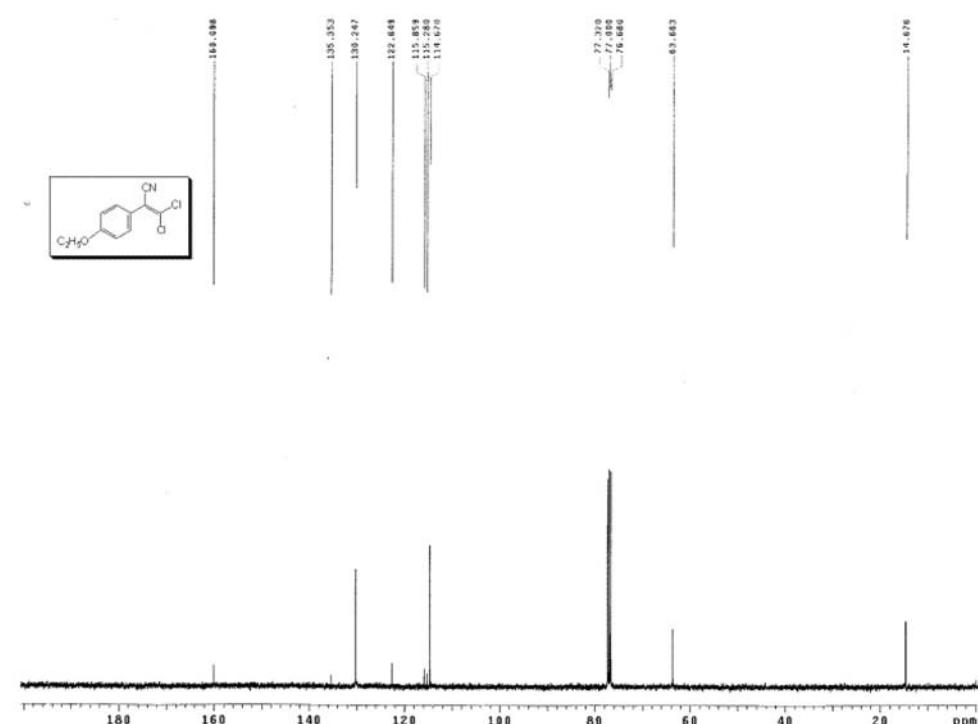


Figure S33. ¹³C NMR spectrum of 2-(4-ethoxyphenyl)-3,3-dichloroacrylonitrile (**1k**).

2-(4-Methoxyphenyl)-3,3-dichloroacrylonitrile (II**)**

IR (KBr) ν_{max} /cm⁻¹: 3067, 2988, 2218, 1589, 1465, 1287, 854, 765; ¹H NMR (CDCl₃, 400 MHz): δ 7.48 (d, 2H, J 9.2 Hz, Ar-H), 6.95 (d, 2H, J 9.2 Hz, Ar-H), 3.84 (s, 3H, CH₃); ¹³C NMR (CDCl₃, 100 MHz): δ 160.7, 135.4, 130.2, 122.8, 115.7, 115.2, 114.2, 55.3.

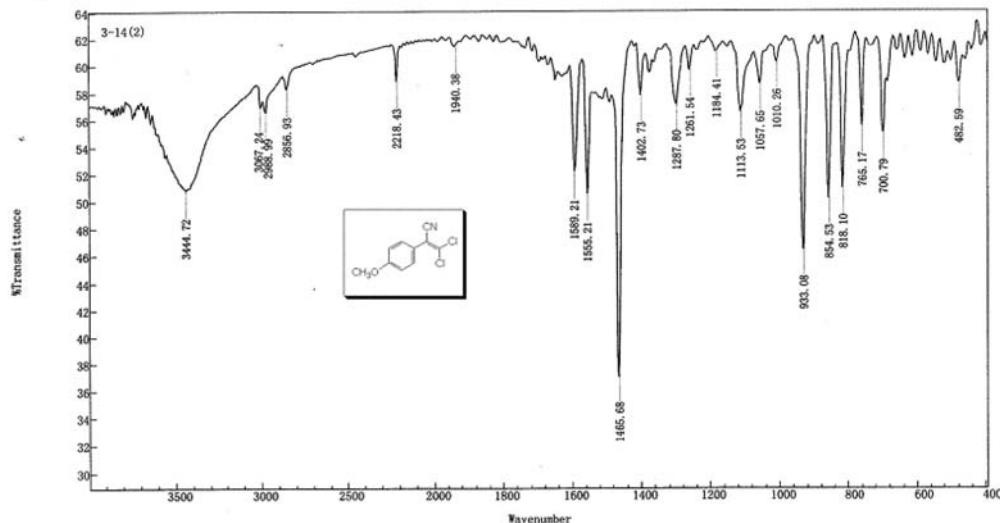
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Figure S34. IR spectrum of 2-(4-methoxyphenyl)-3,3-dichloroacrylonitrile (**II**).

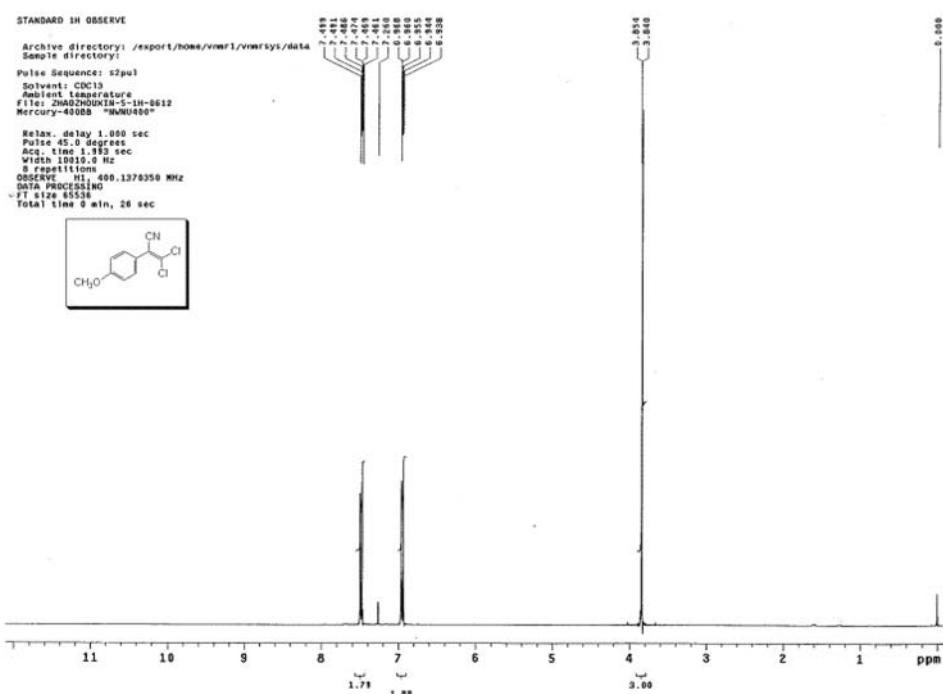


Figure S35. ¹H NMR spectrum of 2-(4-methoxyphenyl)-3,3-dichloroacrylonitrile (**II**).

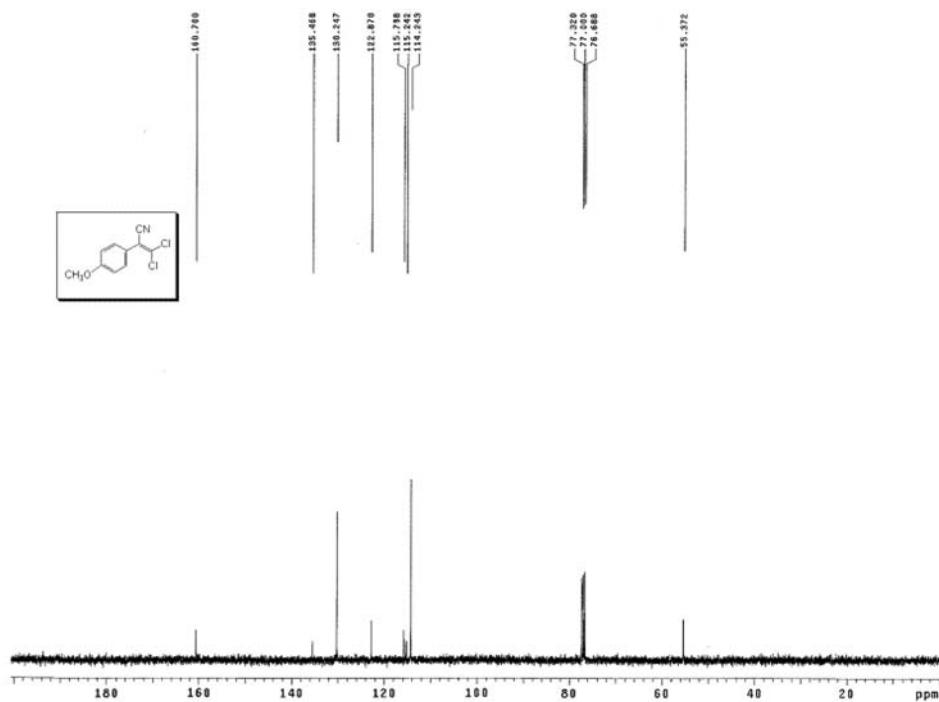


Figure S36. ¹³C NMR spectrum of 2-(4-methoxyphenyl)-3,3-dichloroacrylonitrile (**1l**).

2-(4-Iodophenyl)-3,3-dichloroacrylonitrile (**1m**)

IR (KBr) ν_{max} /cm⁻¹: 3065, 2220, 1572, 1481, 1288, 1276, 933, 834; ¹H NMR (CDCl₃, 400 MHz): δ 7.79 (d, 2H, *J* 8.8 Hz, Ar-H), 7.26 (d, 2H, *J* 8.8 Hz, Ar-H); ¹³C NMR (CDCl₃, 100 MHz): δ 138.1, 137.8, 130.3, 130.1, 115.2, 114.7, 96.6.

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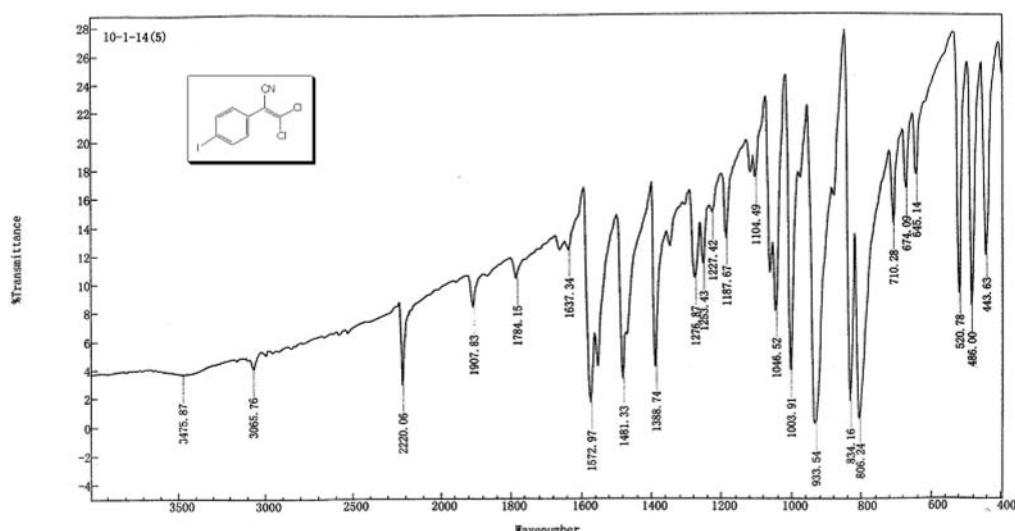


Figure S37. IR spectrum of 2-(4-iodophenyl)-3,3-dichloroacrylonitrile (**1m**).

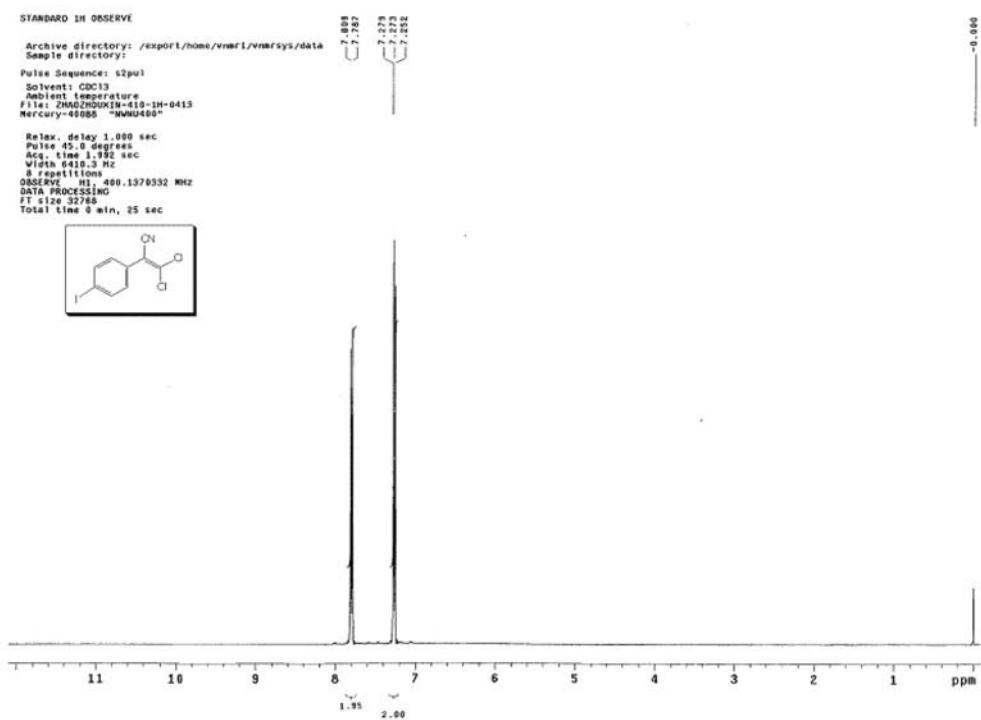


Figure S38. ^1H NMR spectrum of 2-(4-iodophenyl)-3,3-dichloroacrylonitrile (**1m**).

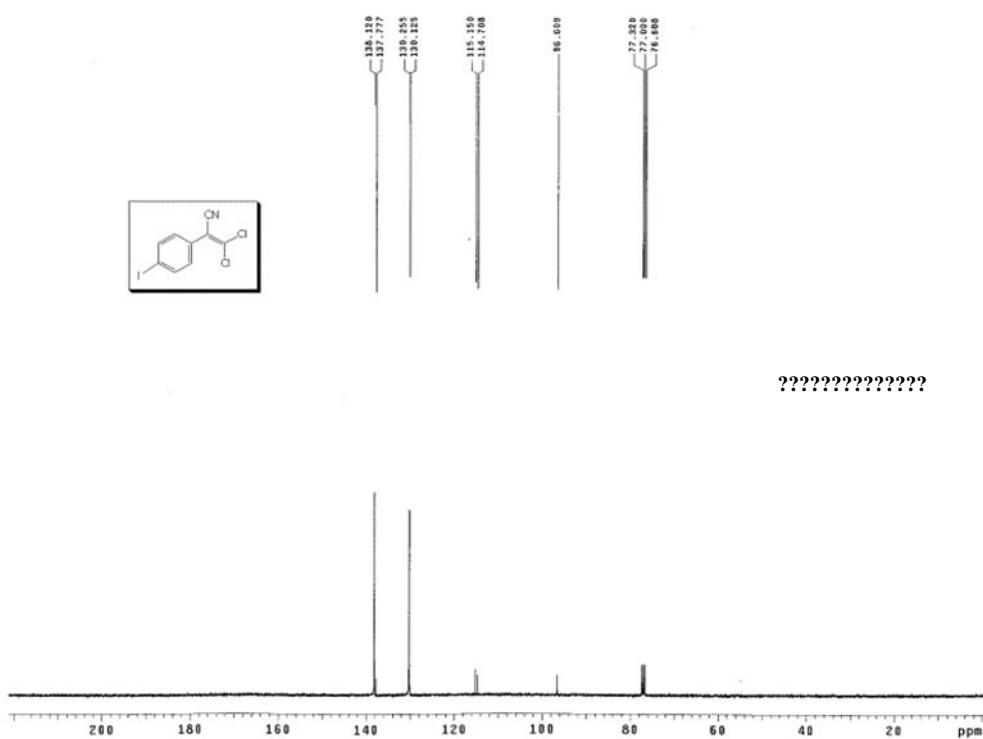


Figure S39. ^{13}C NMR spectrum of 2-(4-iodophenyl)-3,3-dichloroacrylonitrile (**1m**).

2-(Furan-2-yl)-3,3-dichloroacrylonitrile (1n**)**

IR (KBr) ν_{max} /cm⁻¹: 3109, 2923, 2220, 1520, 1350, 931, 858, 817, 698; ¹H NMR (CDCl₃, 400 MHz): δ 7.76 (d, 1H, J 1.6 Hz, Fu-H), 7.04 (d, 1H, J 4.4 Hz, Fu-H), 6.41 (dd, 1H, J 3.6 Hz, J 1.6 Hz, Fu-H); ¹³C NMR (CDCl₃, 100 MHz): δ 148.3, 140.2, 136.6, 130.0, 124.1, 114.7, 113.8.

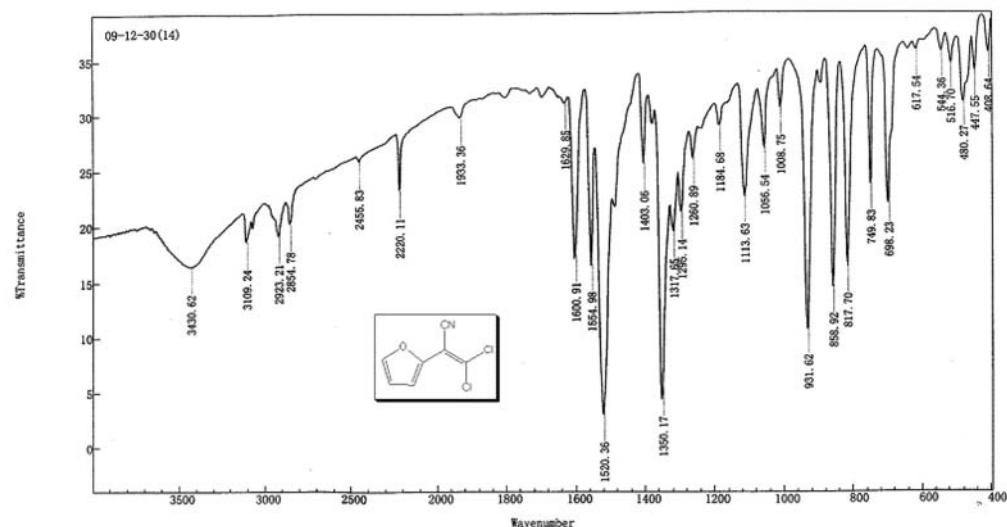
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Figure S40. IR spectrum of 2-(furan-2-yl)-3,3-dichloroacrylonitrile (**1n**).

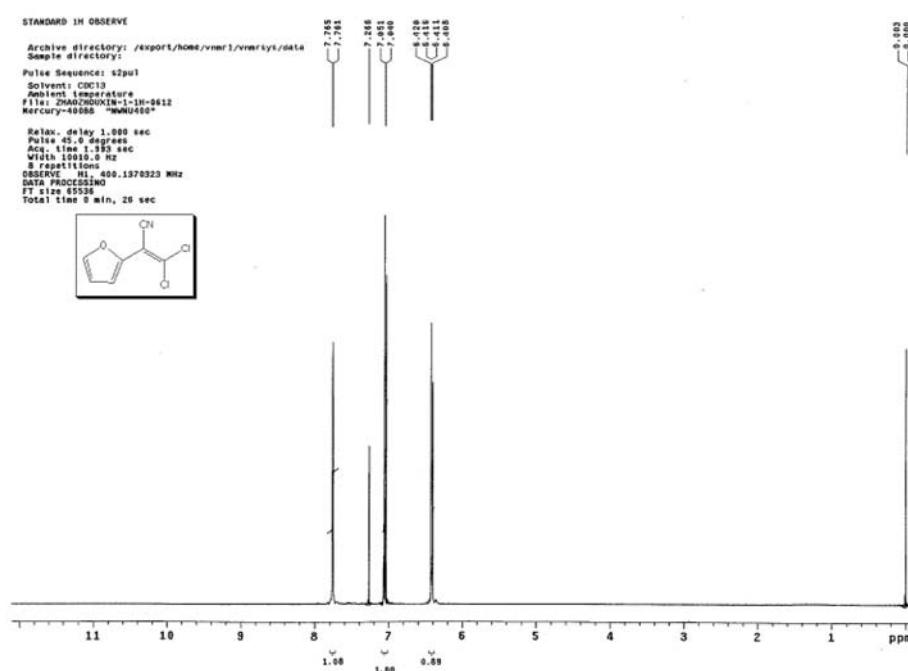


Figure S41. ¹H NMR spectrum of 2-(furan-2-yl)-3,3-dichloroacrylonitrile (**1n**).

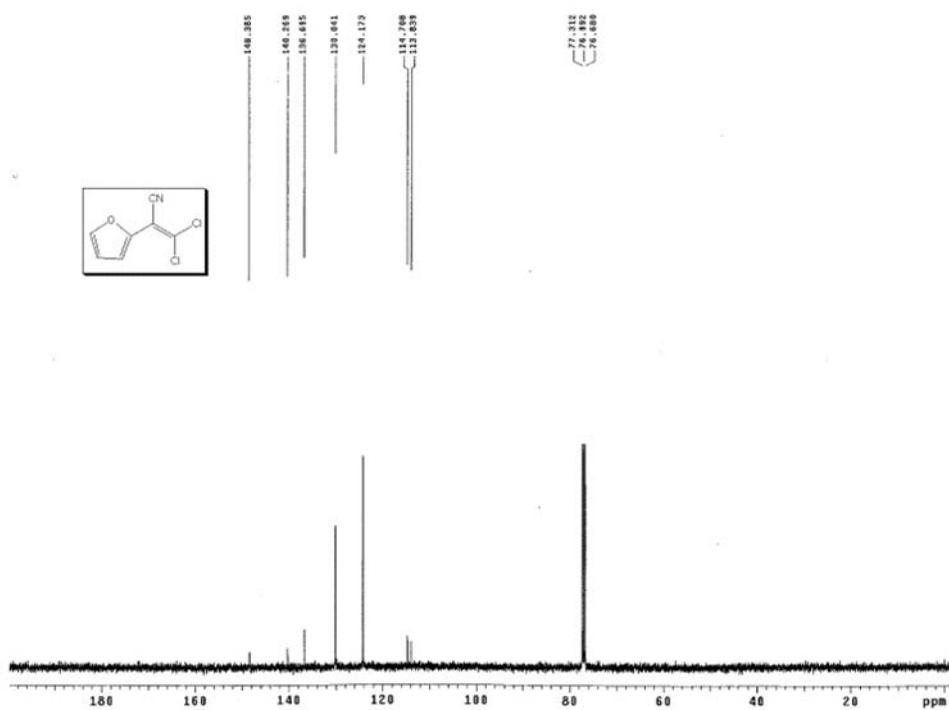


Figure S42. ¹³C NMR spectrum of 2-(furan-2-yl)-3,3-dichloroacrylonitrile (**1n**).

2-*Phenyl-3,3-dibromoacrylonitrile (2a)*

IR (KBr) ν_{max} /cm⁻¹: 3062, 2923, 2216, 1579, 1487, 1247, 842, 752, 692; ¹H NMR (400 MHz, CDCl₃): δ 7.45-7.48 (m, 5H, Ph-H); ¹³C NMR (CDCl₃, 100 MHz): δ 133.3, 130.0, 128.9, 128.5, 122.6, 117.0, 109.7.

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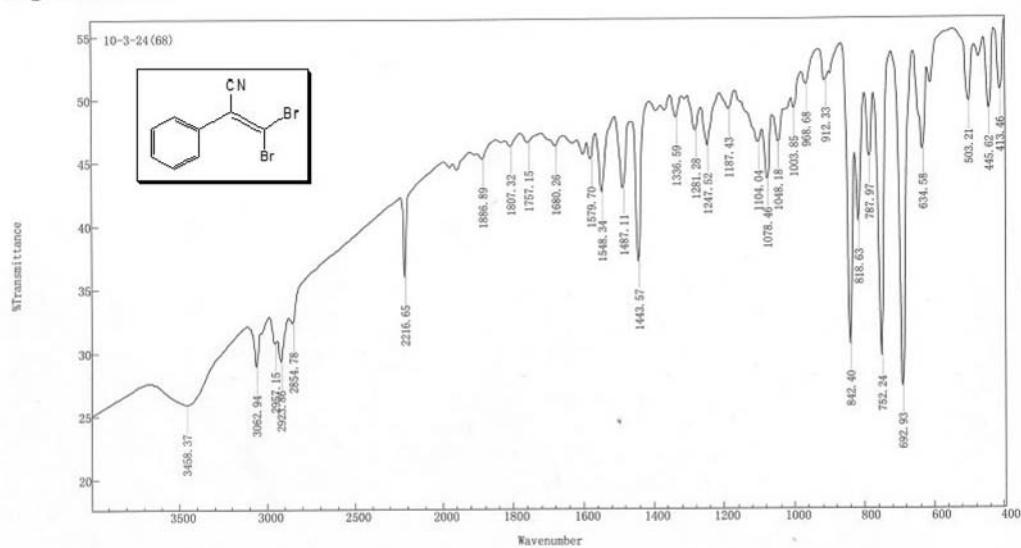


Figure S43. IR spectrum of 2-phenyl-3,3-dibromoacrylonitrile (**2a**).

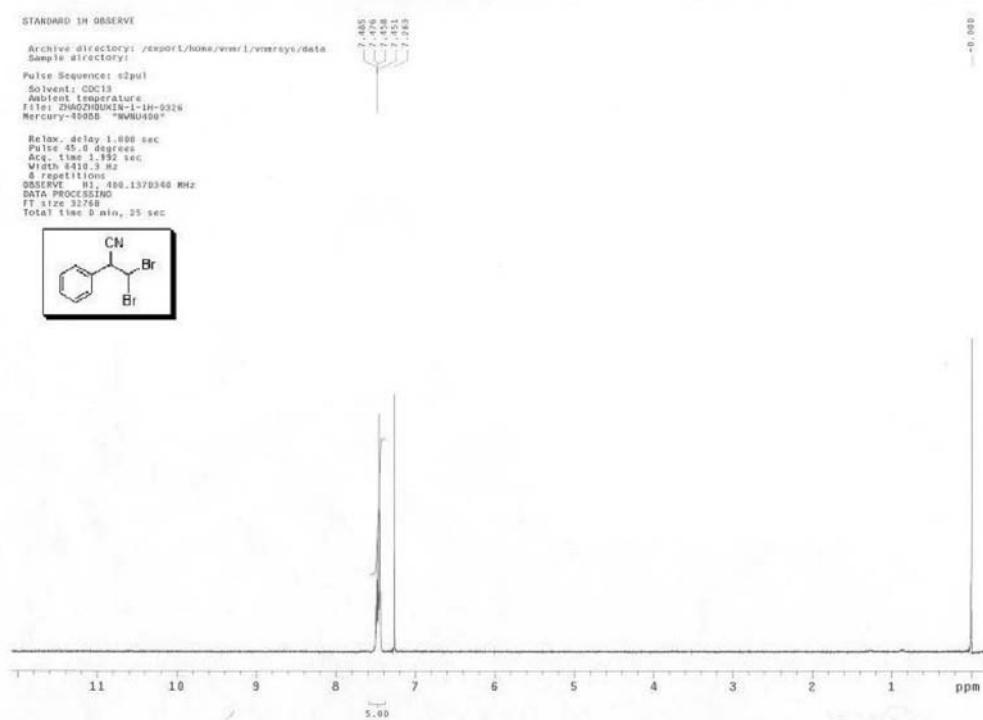


Figure S44. ¹H NMR spectrum of 2-phenyl-3,3-dibromoacrylonitrile (2a).

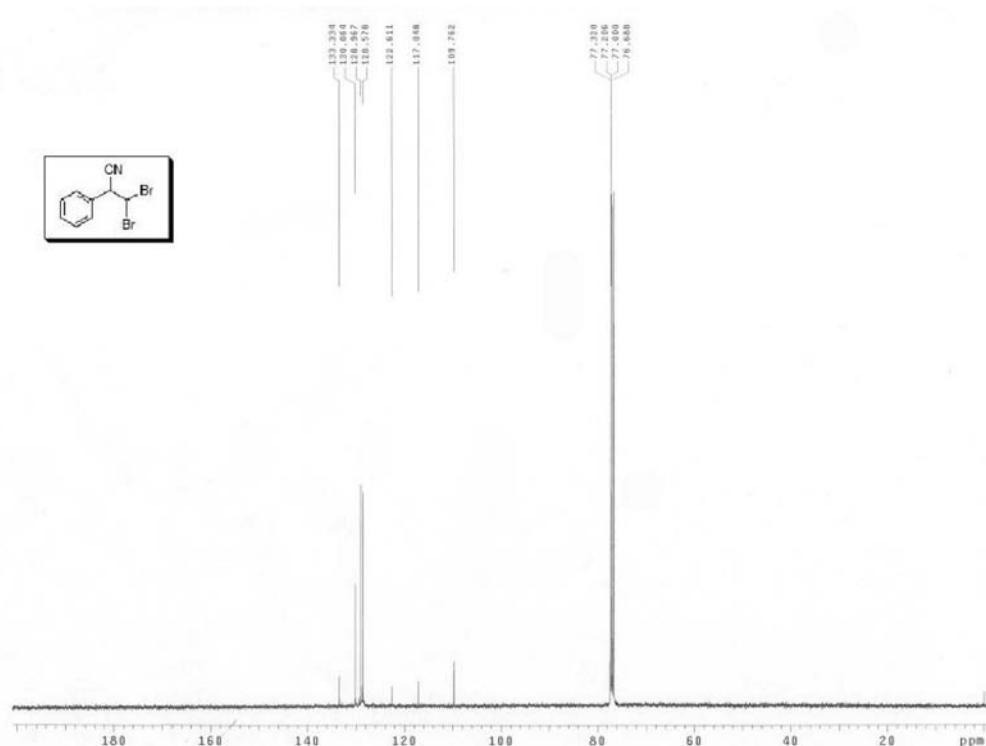


Figure S45. ¹³C NMR spectrum of 2-phenyl-3,3-dibromoacrylonitrile (2a).

2-(2-Chlorophenyl)-3,3-dibromoacrylonitrile (2b**)**

IR (KBr) ν_{max} /cm⁻¹: 3069, 2924, 2218, 1554, 1467, 1435, 1287, 1038, 853, 750; ¹H NMR (400 MHz, CDCl₃): δ 7.50–7.25 (m, 4H, Ph-H); ¹³C NMR (CDCl₃, 100 MHz): δ 132.8, 132.4, 131.5, 130.4, 130.2, 127.4, 120.3, 115.5, 113.9.

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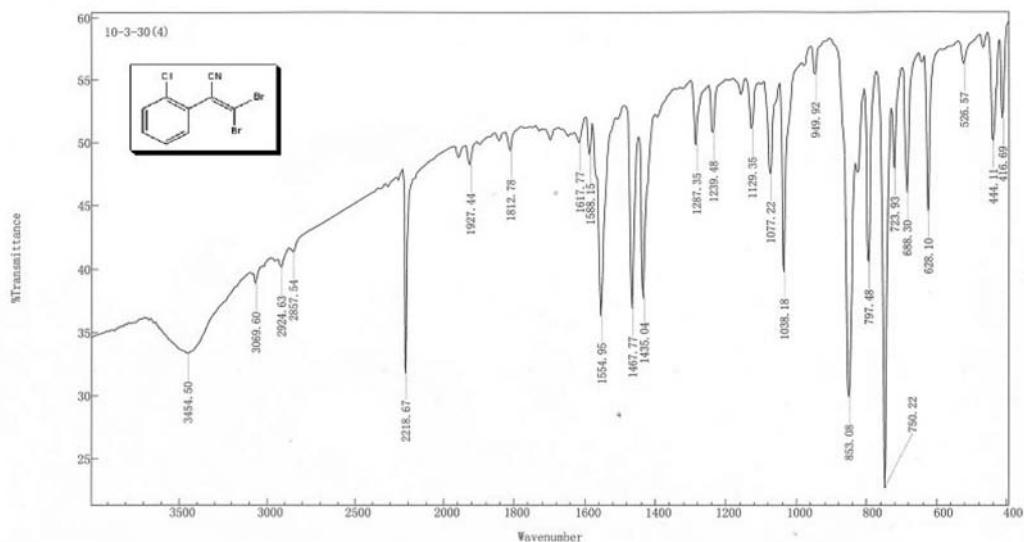


Figure S46. IR spectrum of 2-(2-chlorophenyl)-3,3-dibromoacrylonitrile (**2b**).

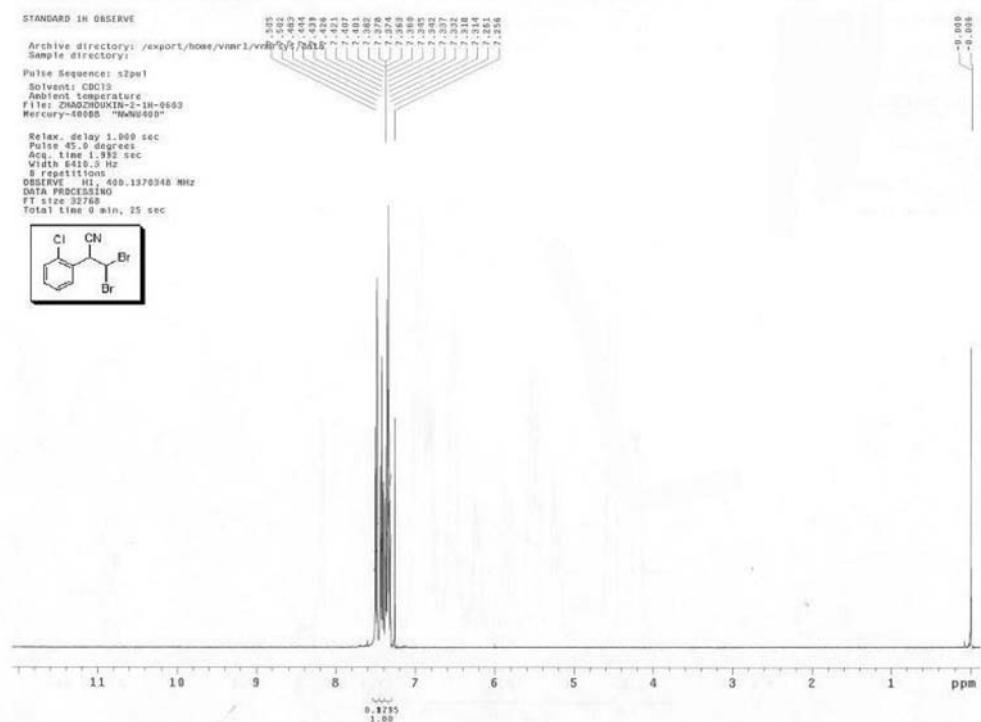


Figure S47. ¹H NMR spectrum of 2-(2-chlorophenyl)-3,3-dibromoacrylonitrile (**2b**).

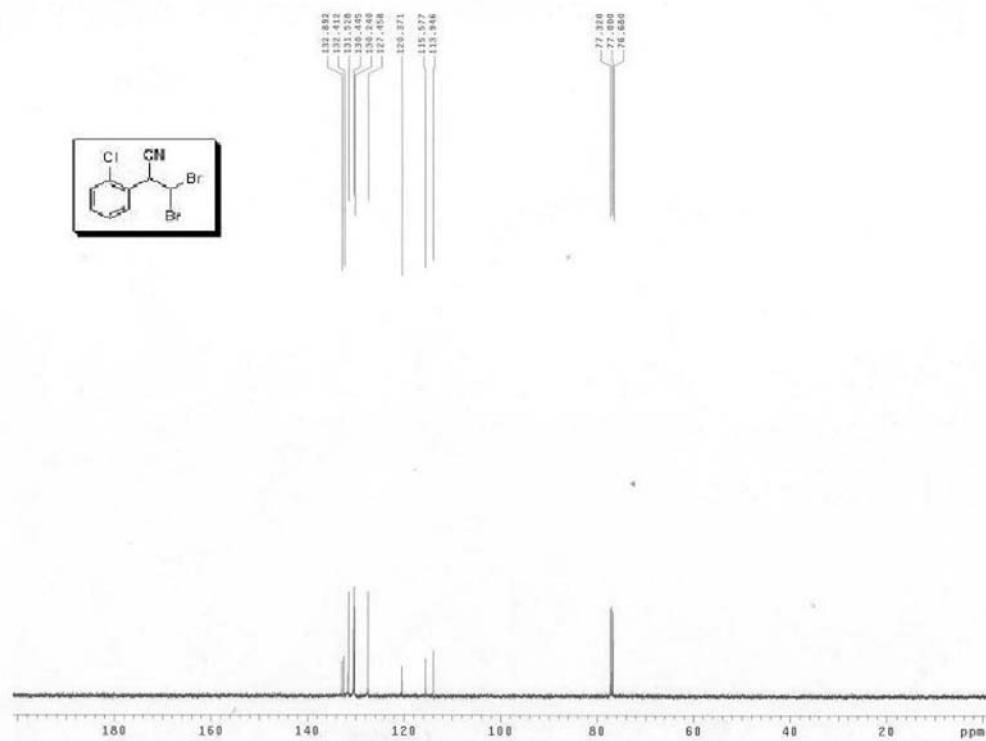


Figure S48. ¹³C NMR spectrum of 2-(2-chlorophenyl)-3,3-dibromoacrylonitrile (**2b**).

2-(3-Chlorophenyl)-3,3-dibromoacrylonitrile (**2c**)

IR (KBr) ν_{max} /cm⁻¹: 3061, 2924, 2218, 1570, 1469, 1254, 852, 785; ¹H NMR (400 MHz, CDCl₃): δ 7.48-7.35 (m, 4H, Ph-H); ¹³C NMR (CDCl₃, 100 MHz): δ 134.9, 134.7, 130.2, 130.2, 128.6, 126.7, 121.2, 116.6, 111.1.

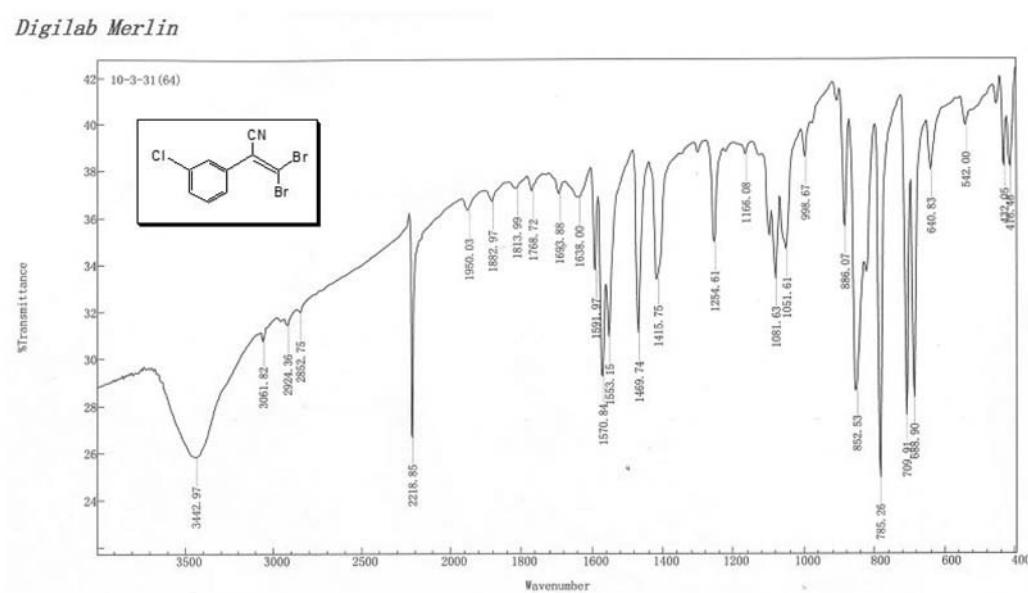


Figure S49. IR spectrum of 2-(3-chlorophenyl)-3,3-dibromoacrylonitrile (**2c**).

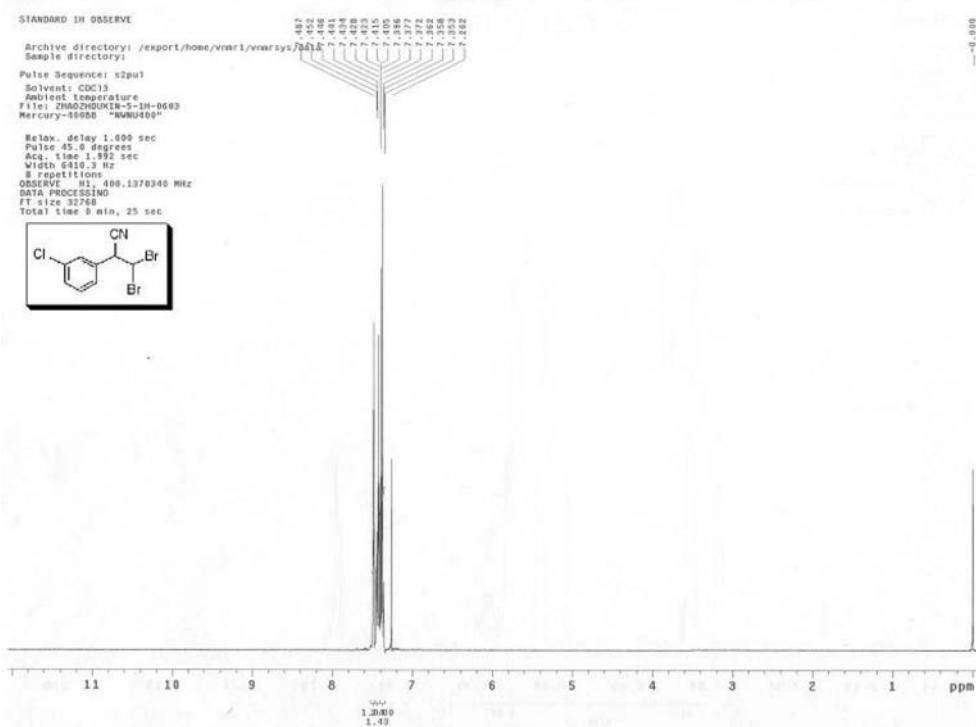


Figure S50. ¹H NMR spectrum of 2-(3-chlorophenyl)-3,3-dibromoacrylonitrile (**2c**).

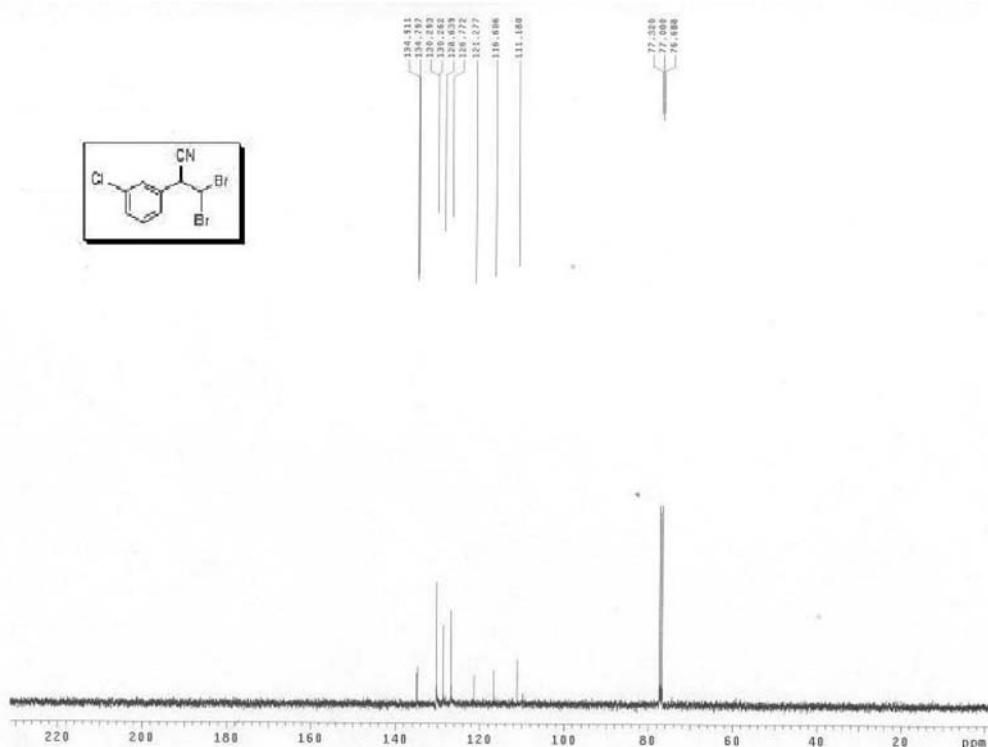


Figure S51. ¹³C NMR spectrum of 2-(3-chlorophenyl)-3,3-dibromoacrylonitrile (**2c**).

2-(4-Chlorophenyl)-3,3-dibromoacrylonitrile (2d)

IR (KBr) ν_{max} /cm⁻¹: 2922, 2213, 1590, 1482, 1396, 1095, 831; ¹H NMR (400 MHz, CDCl₃): δ 7.43 (s, 4H, Ph-H); ¹³C NMR (CDCl₃, 100 MHz): δ 136.2, 131.6, 129.9, 129.2, 121.5, 116.7, 110.4.

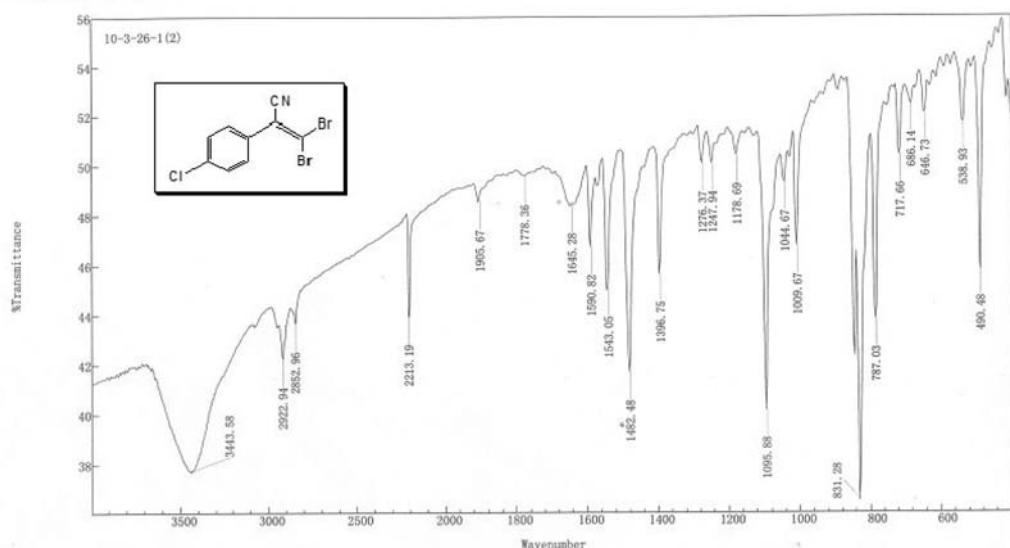
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Figure S52. IR spectrum of 2-(4-chlorophenyl)-3,3-dibromoacrylonitrile (**2d**).

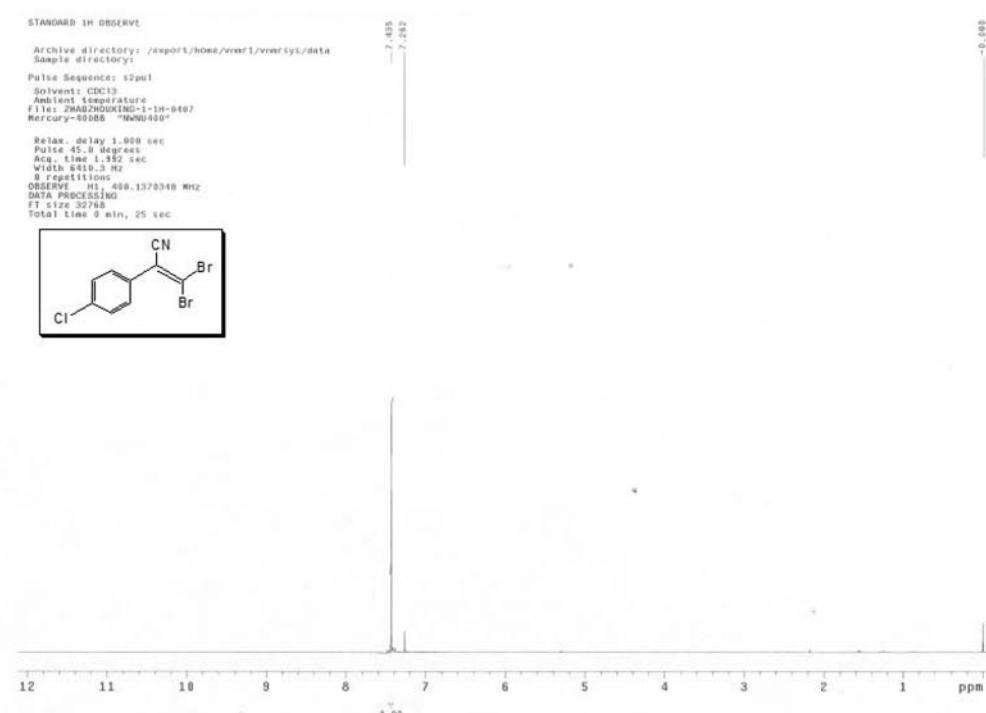


Figure S53. ¹H NMR spectrum of 2-(4-chlorophenyl)-3,3-dibromoacrylonitrile (**2d**).

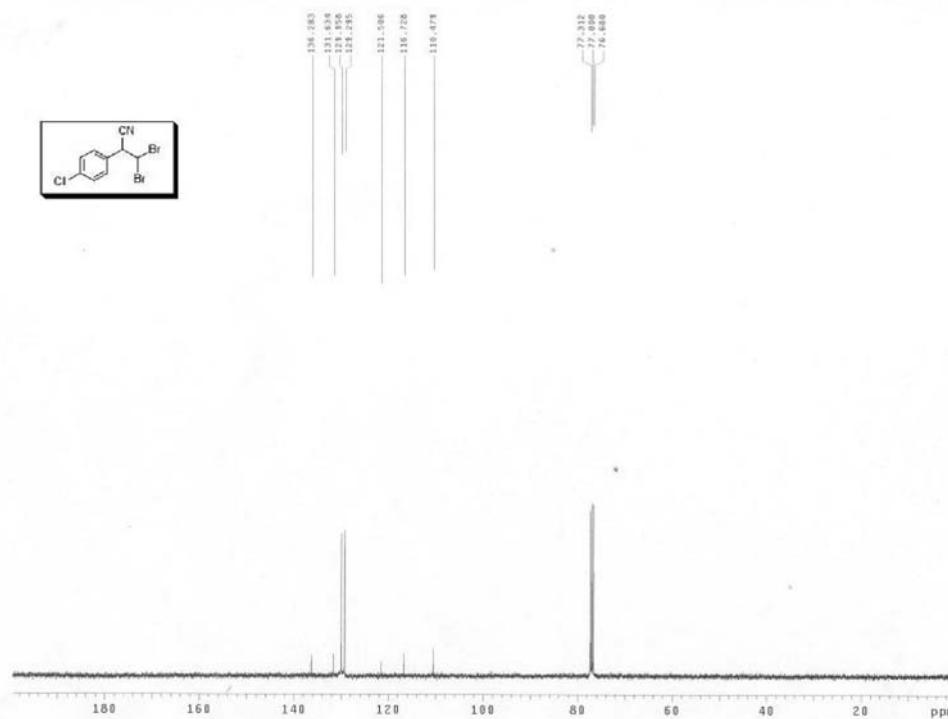


Figure S54. ^{13}C NMR spectrum of 2-(4-chlorophenyl)-3,3-dibromoacrylonitrile (**2d**).

2-(2-Methylphenyl)-3,3-dibromoacrylonitrile (2e**)**

IR (KBr) ν_{max} /cm⁻¹: 3062, 2920, 2214, 1546, 1453, 1251, 852, 735; ^1H NMR (CDCl_3 , 400 MHz): δ 7.37-7.18 (m, 4H, Ar-H), 2.33 (s, 3H, CH_3); ^{13}C NMR (CDCl_3 , 100 MHz): δ 136.1, 133.3, 130.8, 130.2, 128.8, 126.6, 122.4, 116.1, 111.9, 19.3.

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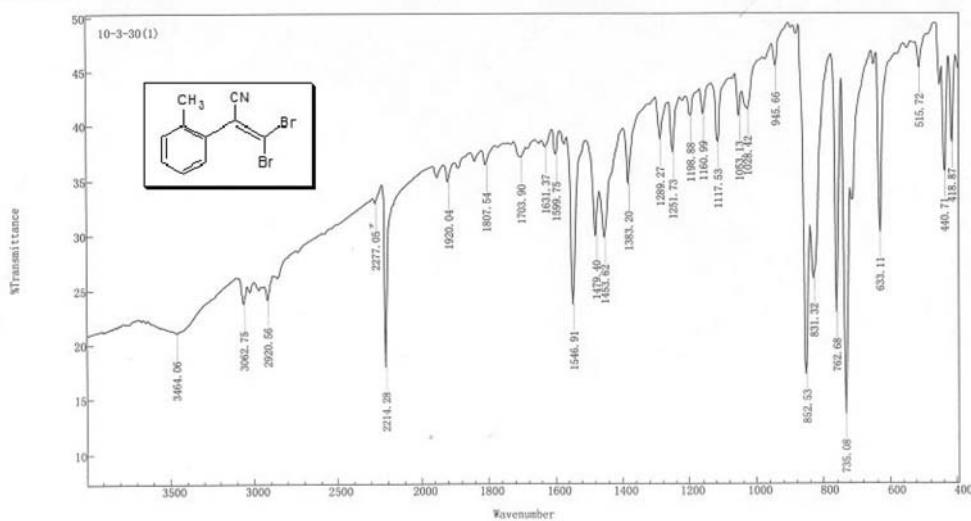


Figure S55. IR spectrum of 2-(2-methylphenyl)-3,3-dibromoacrylonitrile (**2e**).

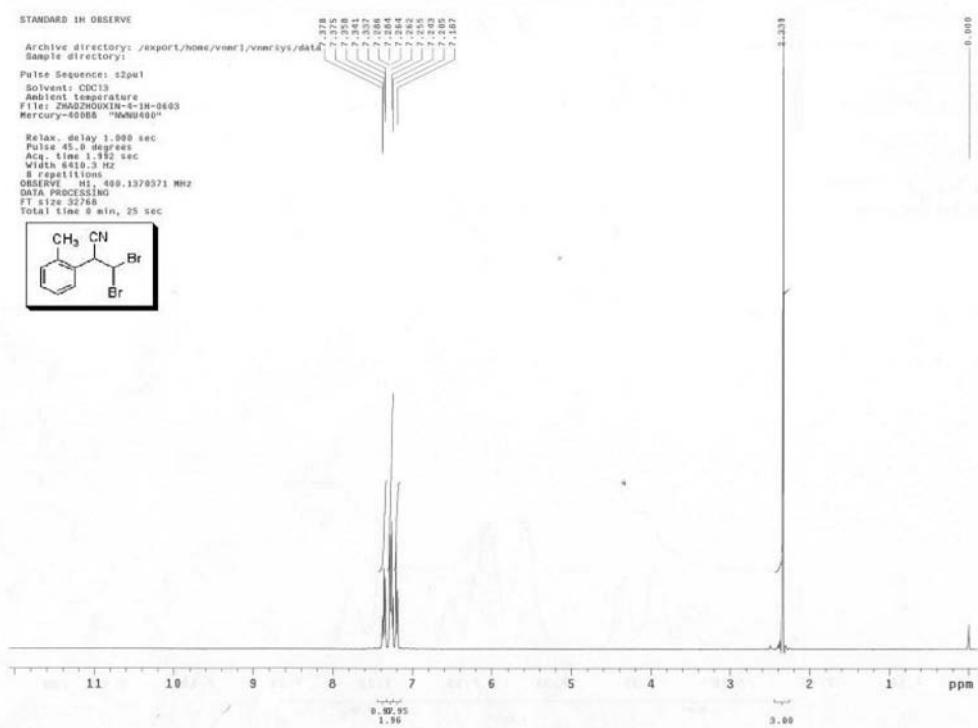


Figure S56. ¹H NMR spectrum of 2-(2-methylphenyl)-3,3-dibromoacrylonitrile (**2e**).

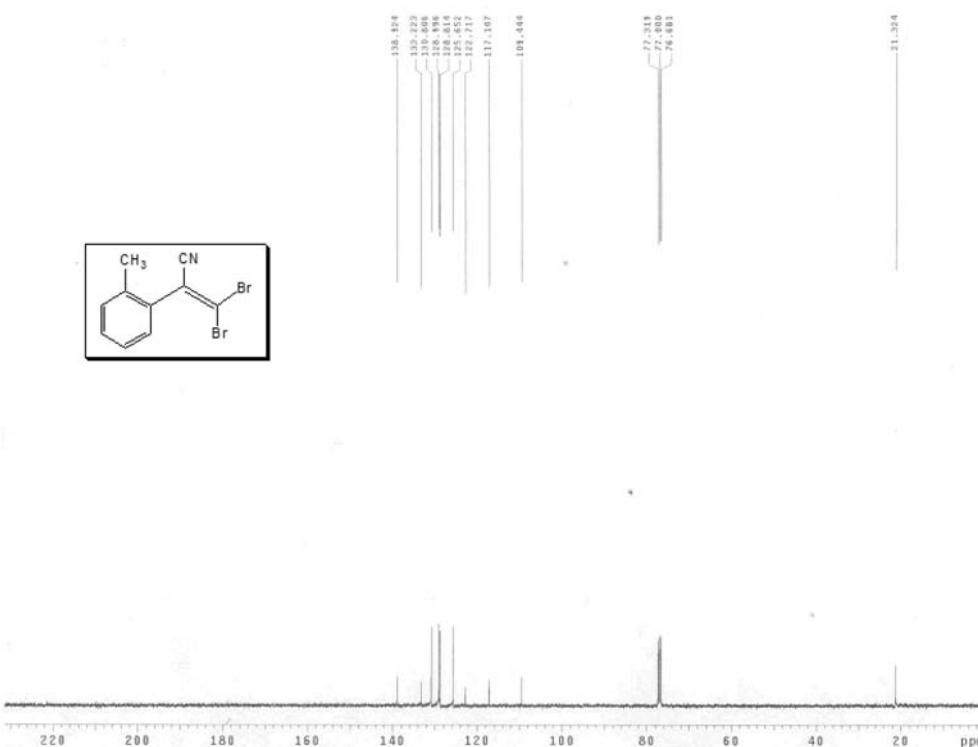


Figure S57. ¹³C NMR spectrum of 2-(2-methylphenyl)-3,3-dibromoacrylonitrile (**2e**).

2-(3-Methylphenyl)-3,3-dibromoacrylonitrile (2f)

IR (KBr) ν_{max} /cm⁻¹: 3018, 2921, 2214, 1600, 1554, 1095, 850, 789; ¹H NMR (400 MHz, CDCl₃): δ 7.34-7.24 (m, 4H, Ar-H), 2.39 (s, 3H, CH₃); ¹³C NMR (CDCl₃, 100 MHz): δ 138.8, 133.2, 130.8, 128.9, 128.8, 125.6, 122.7, 117.1, 109.4, 21.3.

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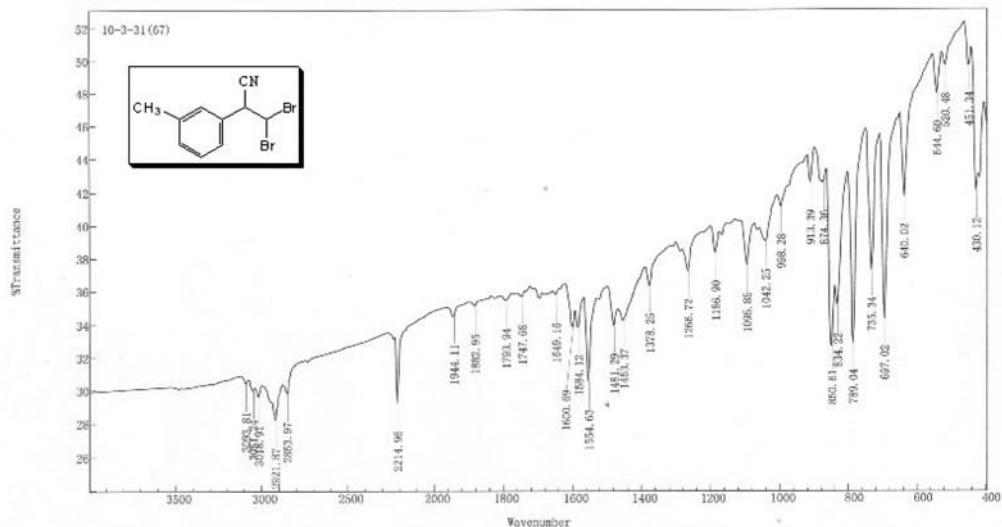


Figure S58. IR spectrum of 2-(3-methylphenyl)-3,3-dibromoacrylonitrile (**2f**).

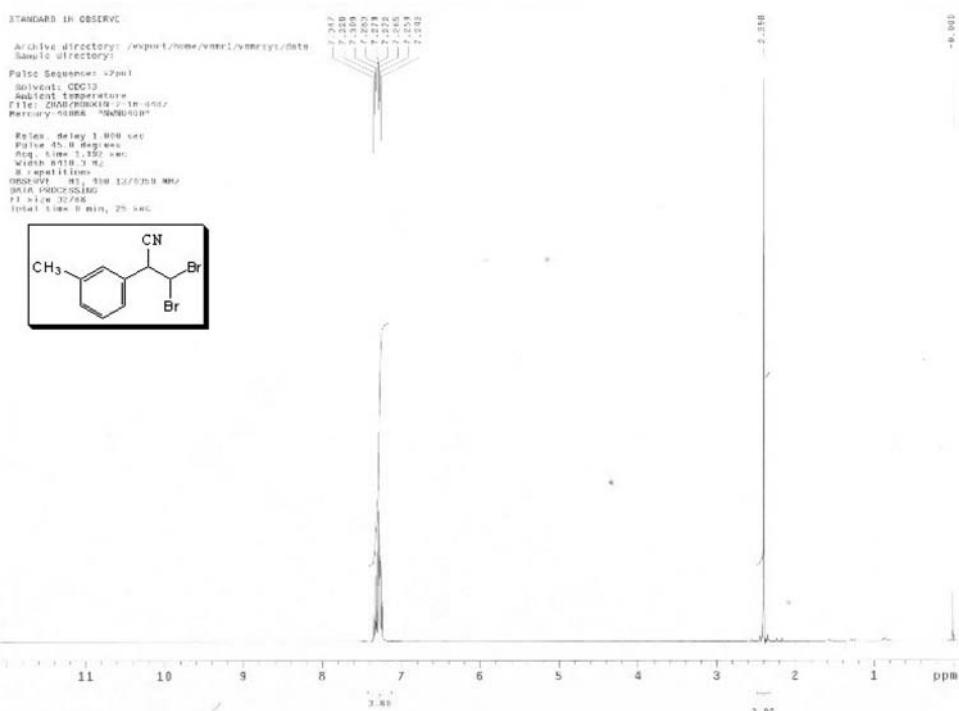


Figure S59. ¹H NMR spectrum of 2-(3-methylphenyl)-3,3-dibromoacrylonitrile (**2f**).

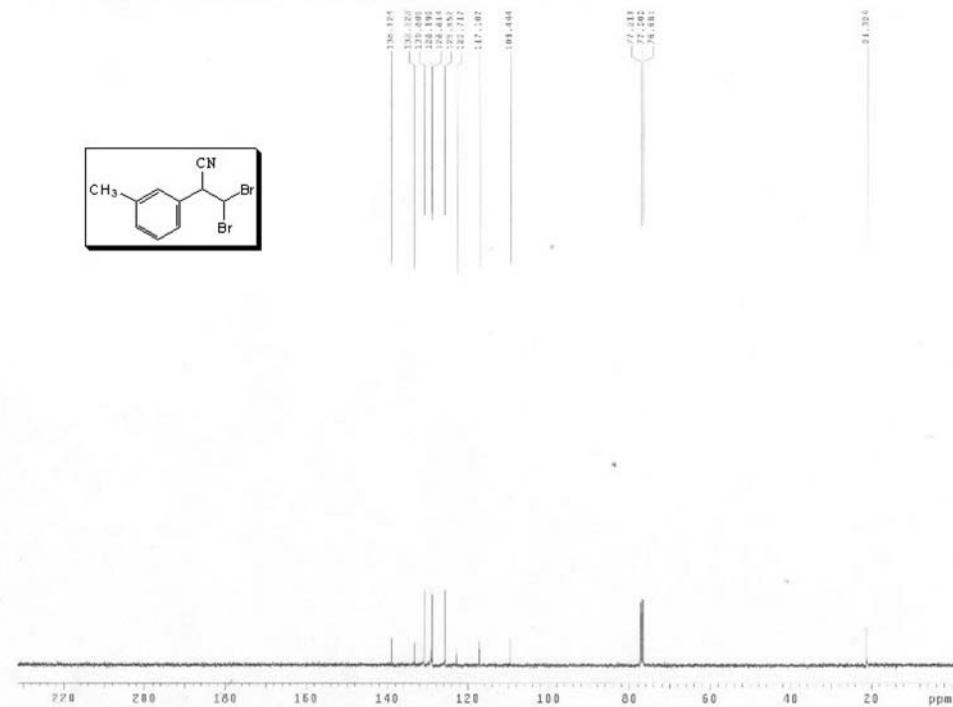


Figure S60. ¹³C NMR spectrum of 2-(3-methylphenyl)-3,3-dibromoacrylonitrile (**2f**).

2-(4-Methylphenyl)-3,3-dibromoacrylonitrile (**2g**)

IR (KBr) ν_{max} /cm⁻¹: 3028, 2917, 2220, 1613, 1551, 1505, 1260, 849, 823, 742; ¹H NMR (CDCl₃, 400 MHz): δ 7.38 (d, 2H, *J* 6.4Hz, Ar-H), 7.25 (d, 2H, *J* 8.8Hz, Ar-H), 2.38 (s, 3H, CH₃); ¹³C NMR (CDCl₃, 100MHz): δ 140.4, 130.4, 129.6, 128.4, 122.6, 117.1, 108.9, 21.4.

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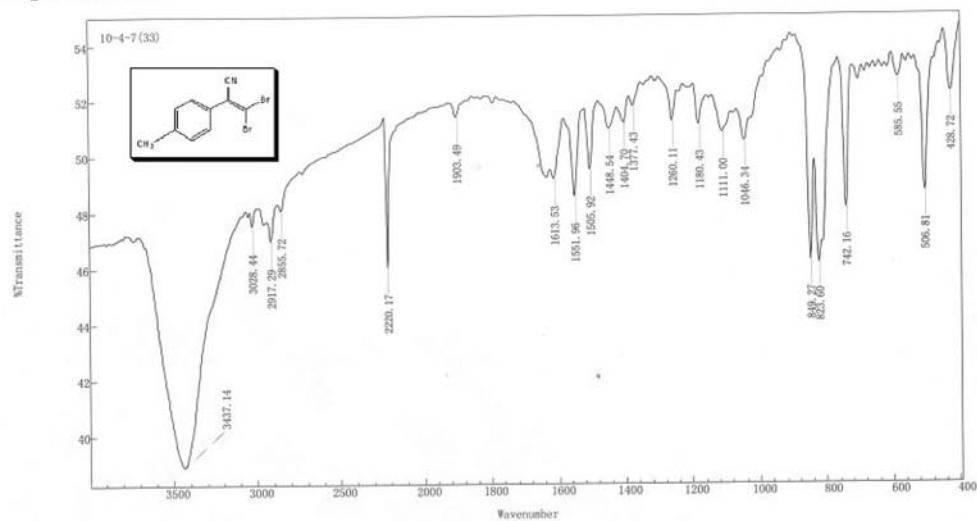


Figure S61. IR spectrum of 2-(4-methylphenyl)-3,3-dibromoacrylonitrile (**2g**).

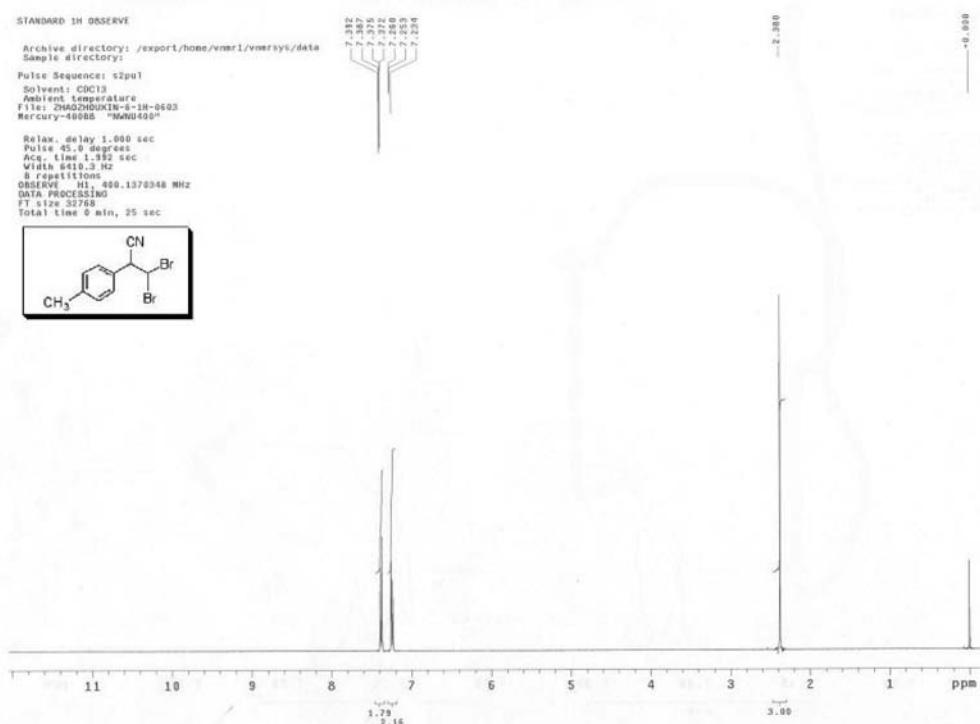


Figure S62. ¹H NMR spectrum of 2-(4-methylphenyl)-3,3-dibromoacrylonitrile (**2g**).

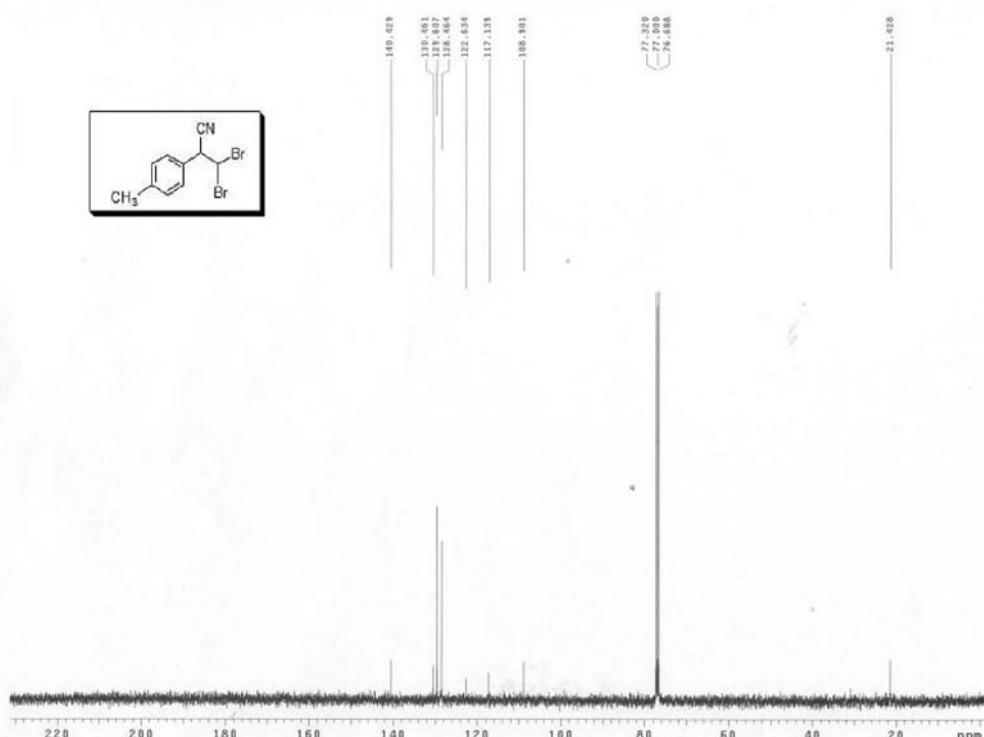


Figure S63. ¹³C NMR spectrum of 2-(4-methylphenyl)-3,3-dibromoacrylonitrile (**2g**).

2-(4-Nitrophenyl)-3,3-dibromoacrylonitrile (2h)

IR (KBr) ν_{max} /cm⁻¹: 3104, 2924, 2216, 1600, 1518, 1350, 1294, 858; ¹H NMR (CDCl₃, 400 MHz): δ 8.32 (d, 2H, *J* 7.2Hz, Ar-H), 7.71 (d, 2H, *J* 7.2Hz, Ar-H); ¹³C NMR (CDCl₃, 100MHz): δ 148.3, 139.1, 129.9, 124.2, 120.6, 116.2, 112.7.

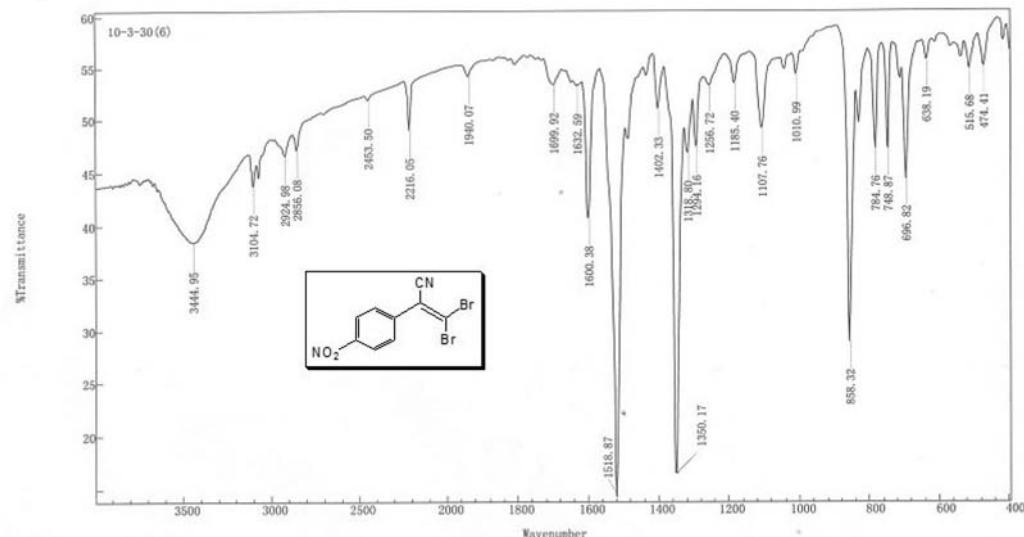
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Figure S64. IR spectrum of 2-(4-nitrophenyl)-3,3-dibromoacrylonitrile (**2h**).

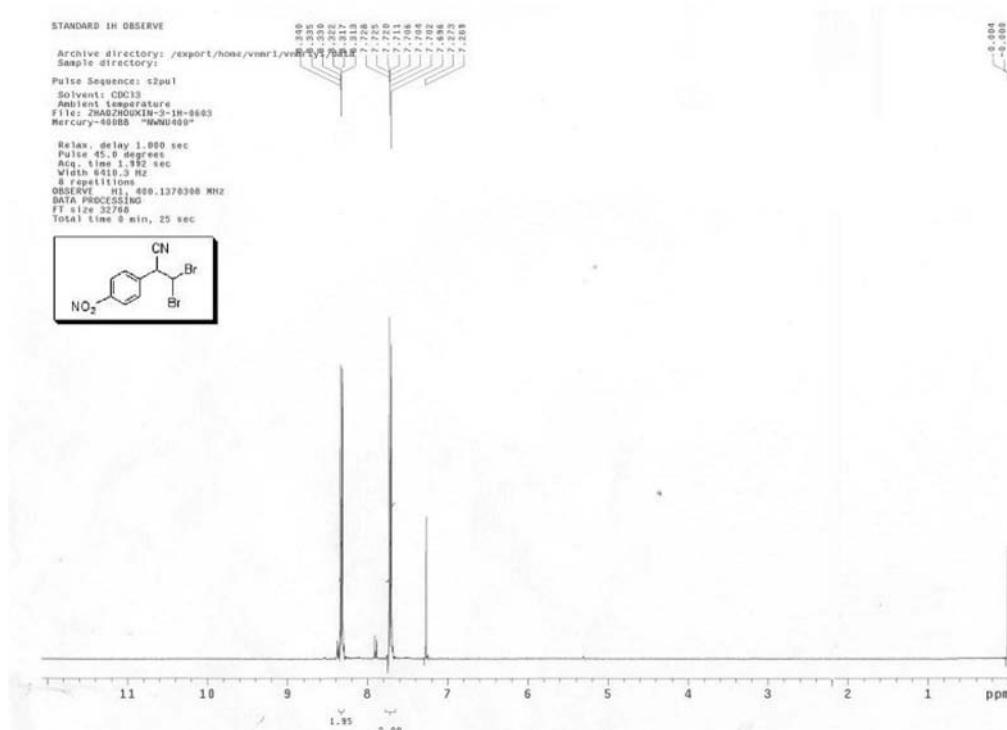


Figure S65. ¹H NMR spectrum of 2-(4-nitrophenyl)-3,3-dibromoacrylonitrile (**2h**).

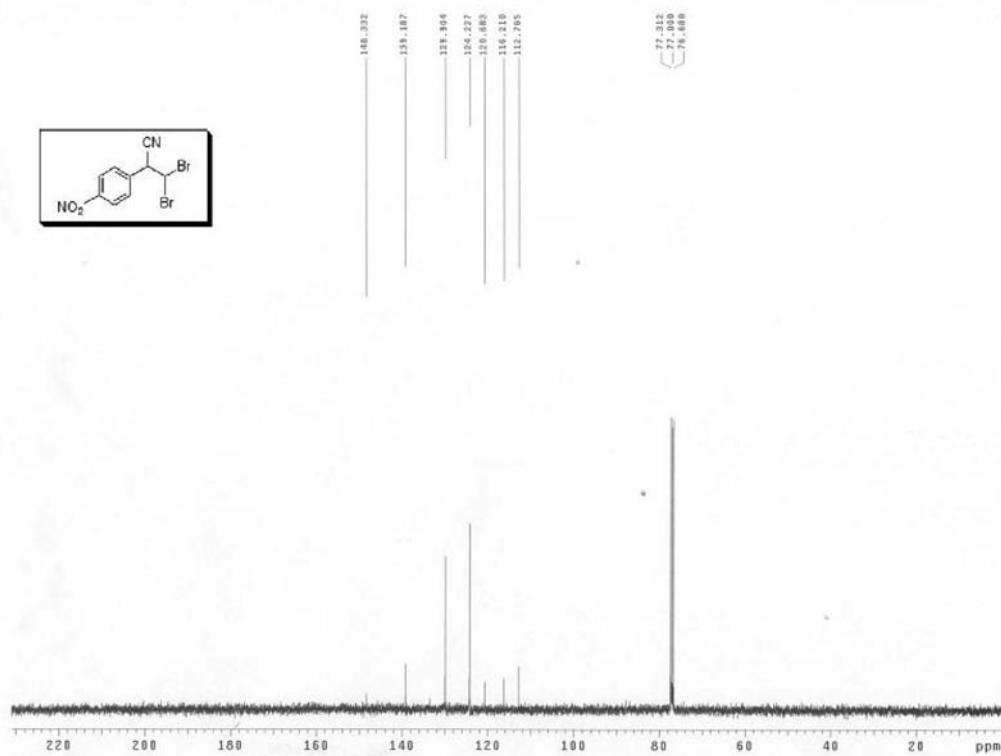


Figure S66. ^{13}C NMR spectrum of 2-(4-nitrophenyl)-3,3-dibromoacrylonitrile (**2h**).

2-(3,5-Dinitrophenoxy)-3,3-dibromoacrylonitrile (2i**)**

^1H NMR (CDCl_3 , 400 MHz): δ 9.13 (s, 1H, Ar-H), 8.74 (s, 2H, Ar-H); ^{13}C NMR (CDCl_3 , 100 MHz): δ 148.7, 136.3, 129.0, 128.9, 120.0, 118.4, 115.6; IR (KBr) ν_{max} /cm $^{-1}$: 3094, 2983, 2224, 1627, 1543, 1344, 1279, 918, 853, 729.

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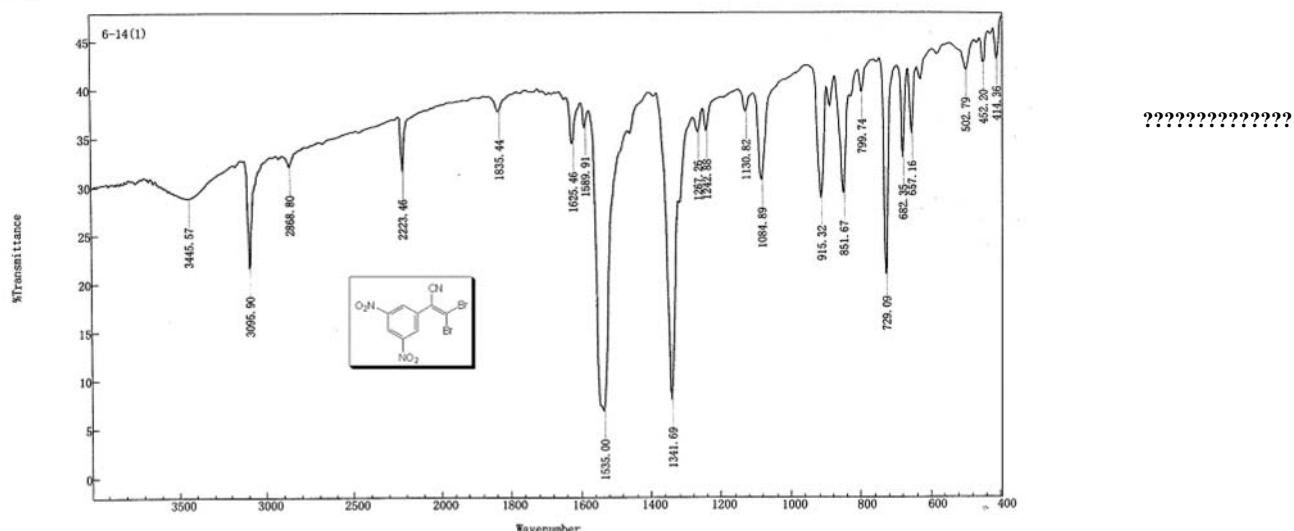


Figure S67. IR spectrum of 2-(3,5-dinitrophenyl)-3,3-dibromoacrylonitrile (**2i**).

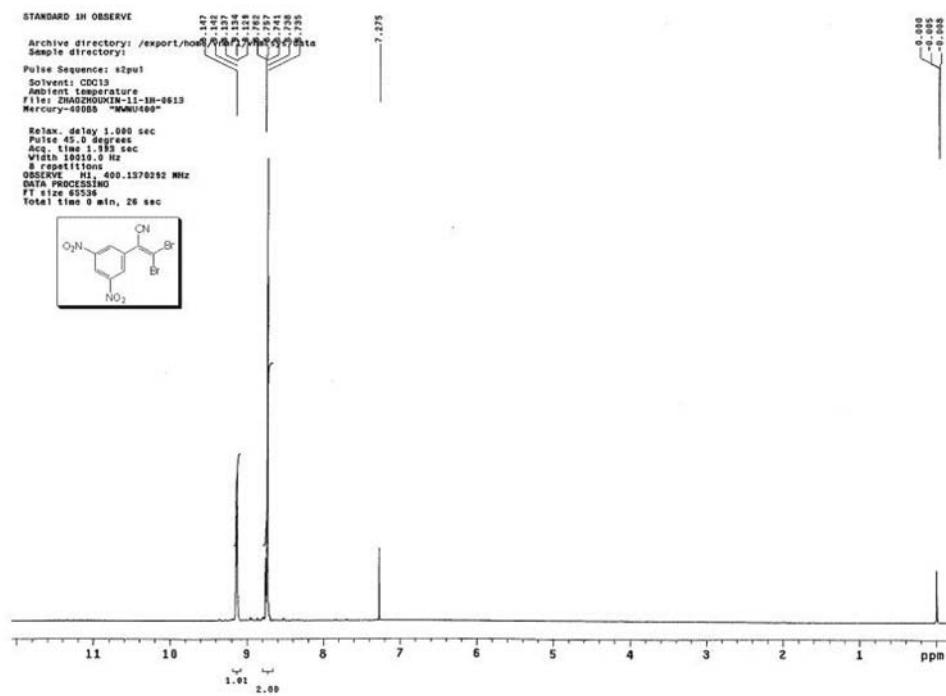


Figure S68. ^1H NMR spectrum of 2-(3,5-dinitrophenyl)-3,3-dibromoacrylonitrile (**2i**).

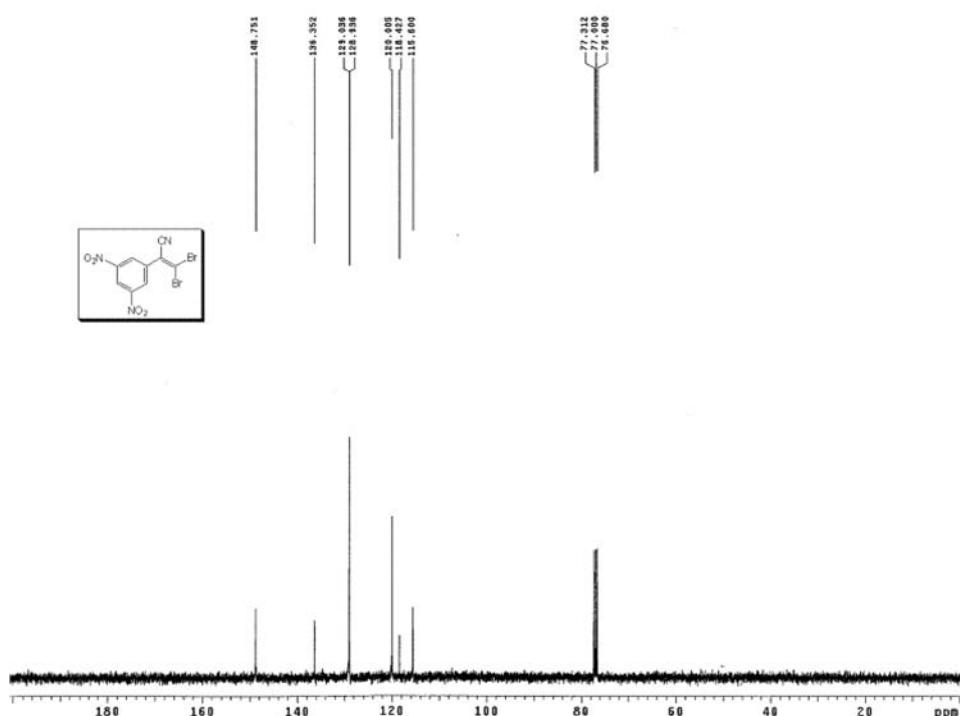


Figure S69. ^{13}C NMR spectrum of 2-(3,5-dinitrophenyl)-3,3-dibromoacrylonitrile (**2i**).

2-(3-Nitrophenyl)-3,3-dibromoacrylonitrile (2j)

IR (KBr) ν_{max} /cm⁻¹: 3088, 2924, 2218, 1615, 1531, 1346, 1255, 860, 687; ¹H NMR (CDCl₃, 400 MHz): δ 8.41 (s, 1H, Ar-H), 8.33 (d, 1H, J 8.4Hz, Ar-H), 7.84 (d, 1H, J 8.4Hz, Ar-H), 7.69 (t, 1H, J 8.4Hz, Ar-H); ¹³C NMR (CDCl₃, 100MHz): δ 148.3, 134.7, 134.5, 130.3, 124.8, 123.8, 120.3, 116.2, 112.8.

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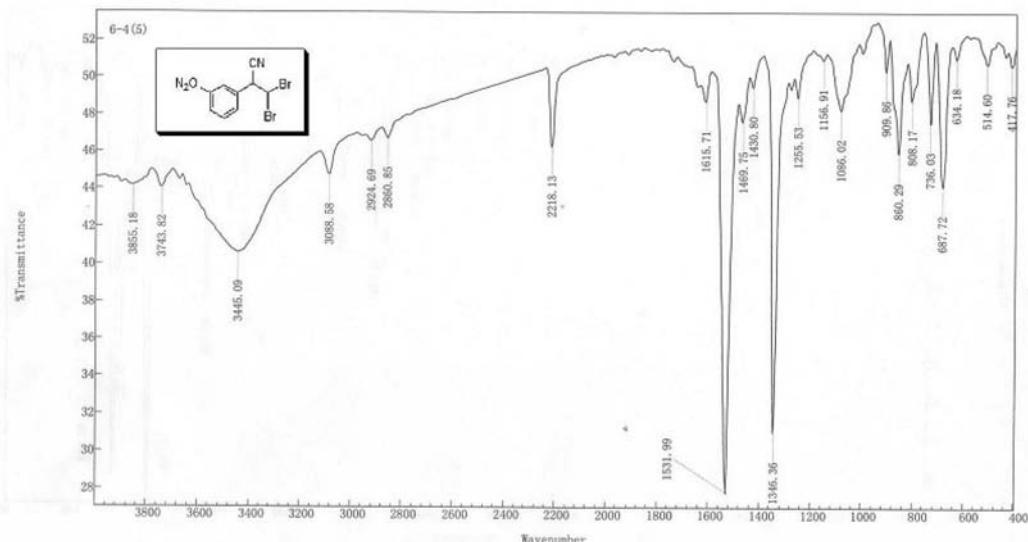
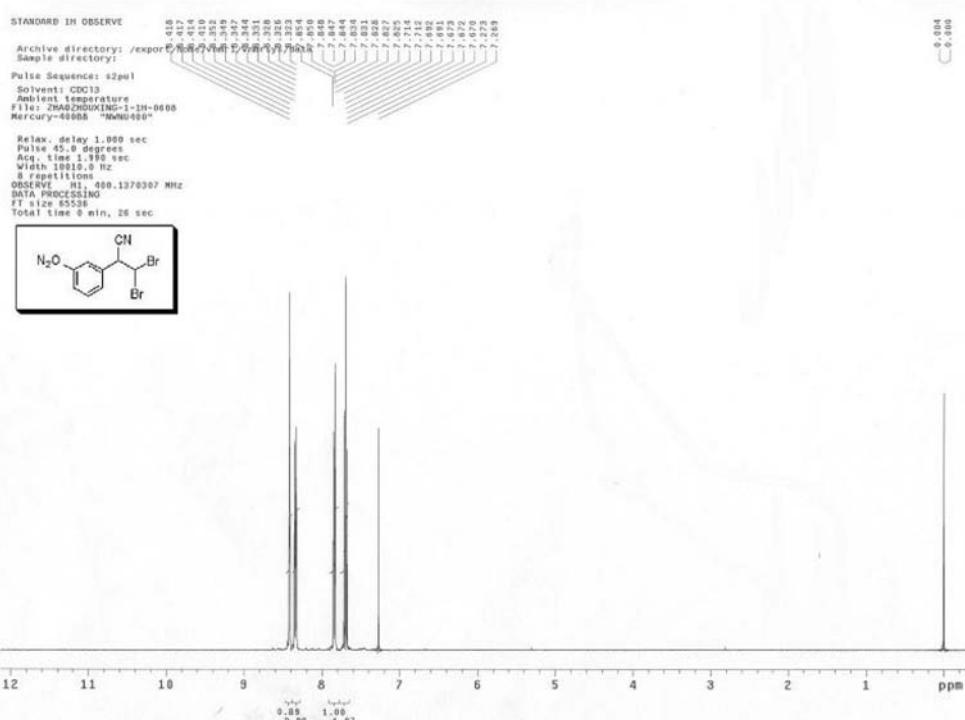


Figure S70. IR spectrum of 2-(3-nitrophenyl)-3,3-dibromoacrylonitrile (2j).



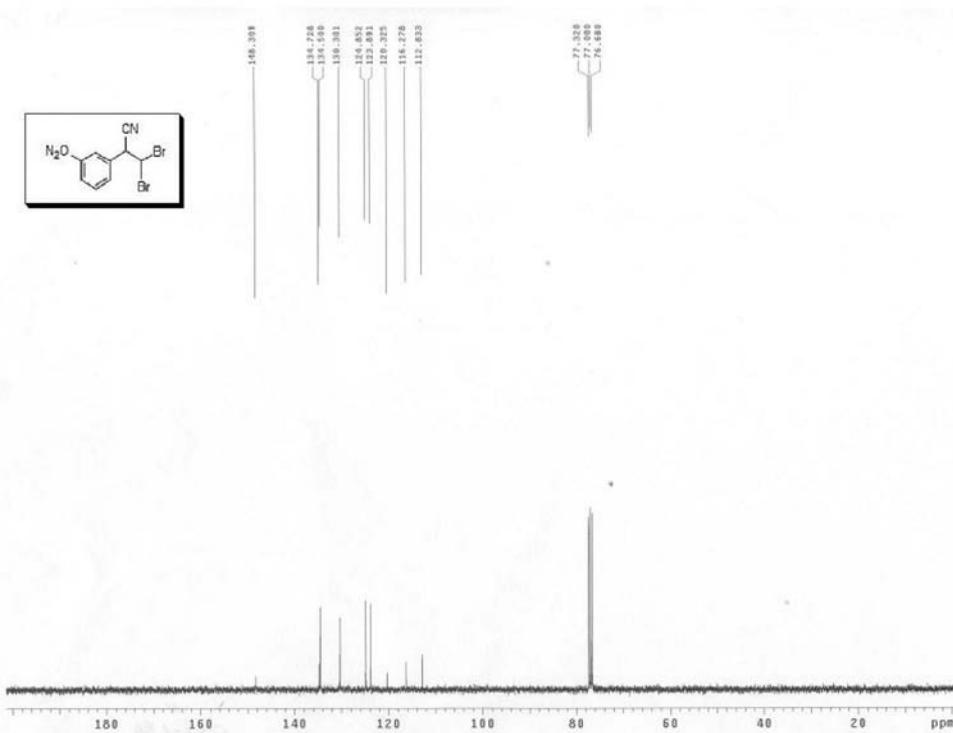


Figure S72. ¹³C NMR spectrum of 2-(3-nitrophenyl)-3,3-dibromoacrylonitrile (**2j**).

2-(4-Methoxyphenyl)-3,3-dibromoacrylonitrile (**2k**)

IR (KBr) ν_{max} /cm⁻¹: 2999, 2939, 2214, 1605, 1508, 1259, 1182, 1021, 829. ¹H NMR (CDCl₃, 400 MHz): δ 7.44 (d, 2H, *J* 9.2 Hz, Ar-H), 6.94 (d, 2H, *J* 9.2 Hz, Ar-H), 3.84 (s, 3H, CH₃). ¹³C NMR (CDCl₃, 100 MHz): δ 160.6, 130.1, 125.4, 122.2, 117.1, 114.2, 108.0, 55.3.

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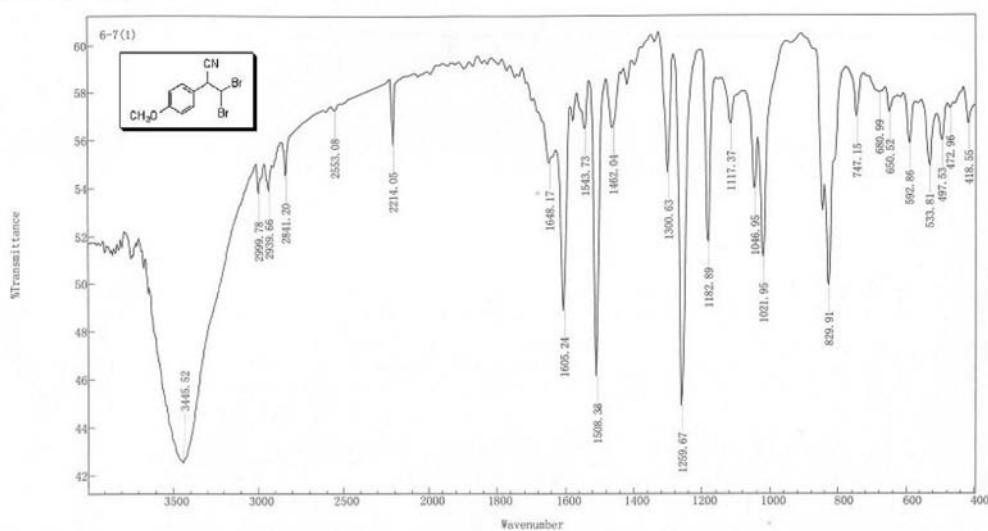


Figure S73. IR spectrum of 2-(4-methoxyphenyl)-3,3-dibromoacrylonitrile (**2k**).

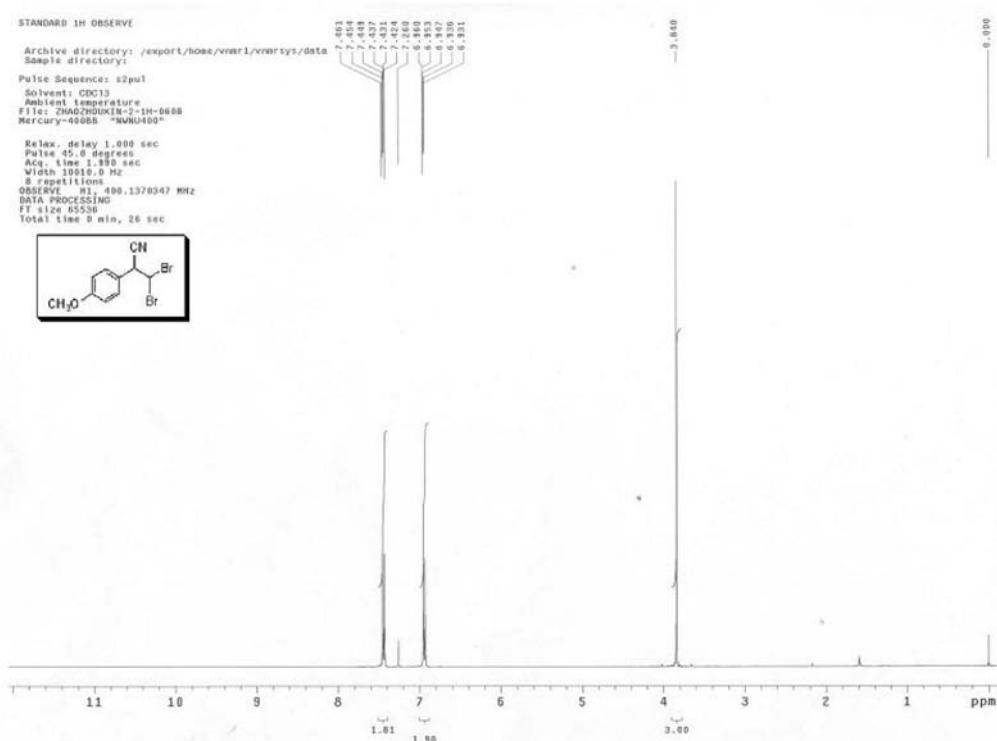


Figure S74. ¹H NMR spectrum of 2-(4-methoxyphenyl)-3,3-dibromoacrylonitrile (**2k**).

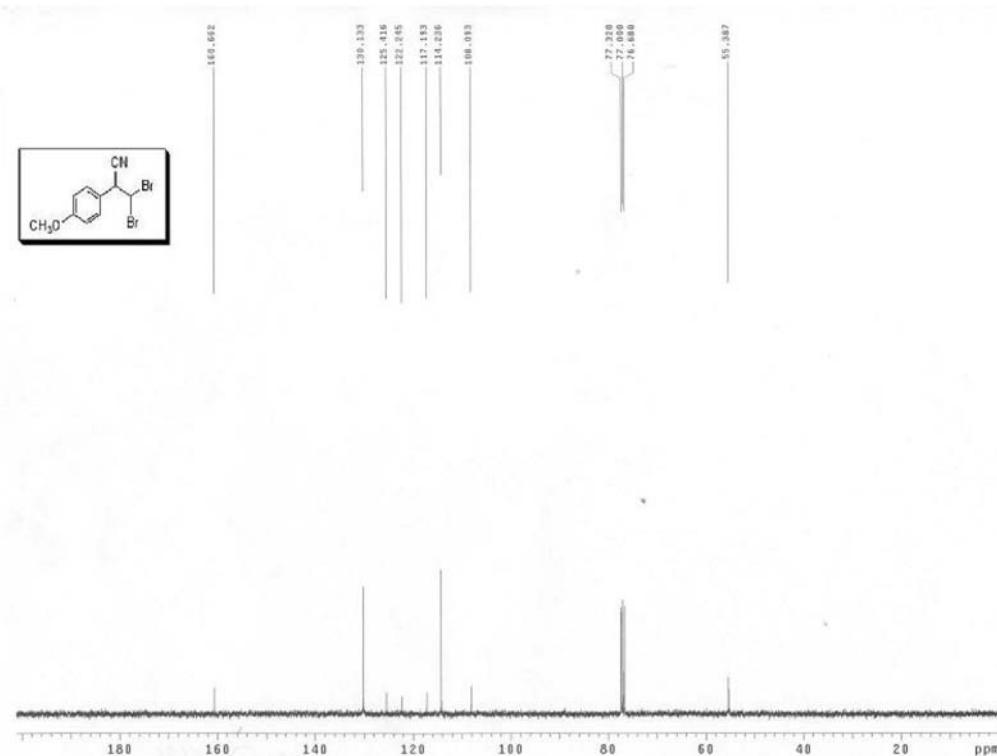


Figure S75. ¹³C NMR spectrum of 2-(4-methoxyphenyl)-3,3-dibromoacrylonitrile (**2k**).

2-(4-Biphenyl)-3,3-dibromoacrylonitrile (2l)

IR (KBr) ν_{max} /cm⁻¹: 3063, 2922, 2223, 1600, 1479, 1400, 842, 767; ¹H NMR (400 MHz, CDCl₃): δ 7.74-7.42 (m, 9H, Ar-H); ¹³C NMR (CDCl₃, 100 MHz): δ 145.6, 139.1, 132.5, 132.4, 129.0, 128.6, 127.7, 127.2, 122.1, 118.9, 110.8.

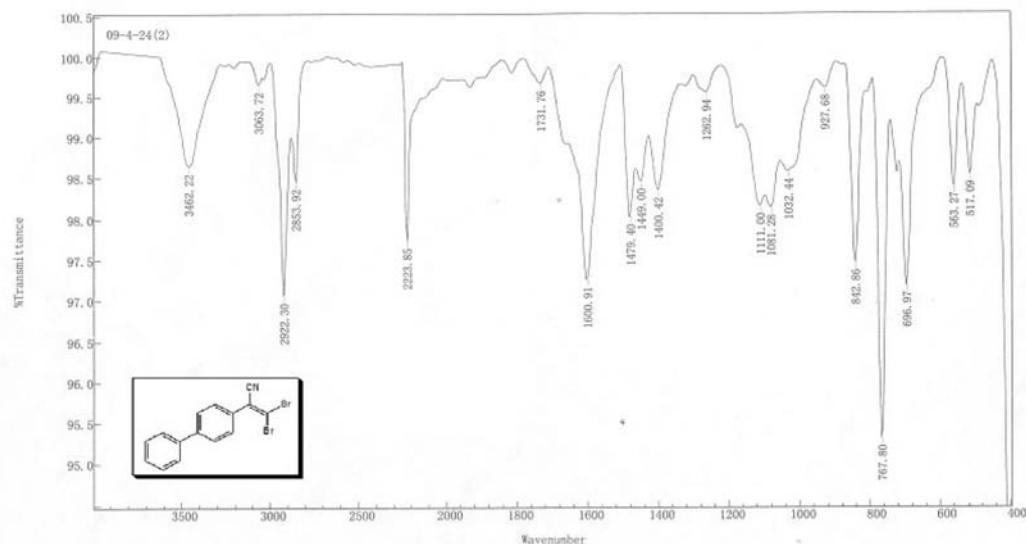
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Figure S76. IR spectrum of 2-(4-biphenyl)-3,3-dibromoacrylonitrile (2l).

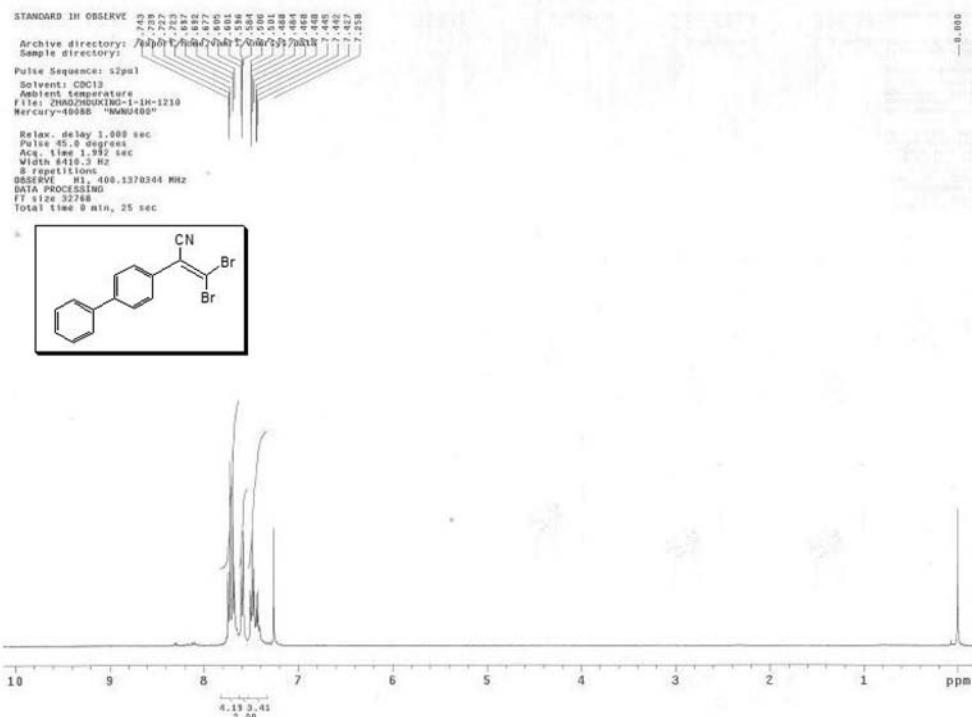


Figure S77. ¹H NMR spectrum of 2-(4-biphenyl)-3,3-dibromoacrylonitrile (2l).

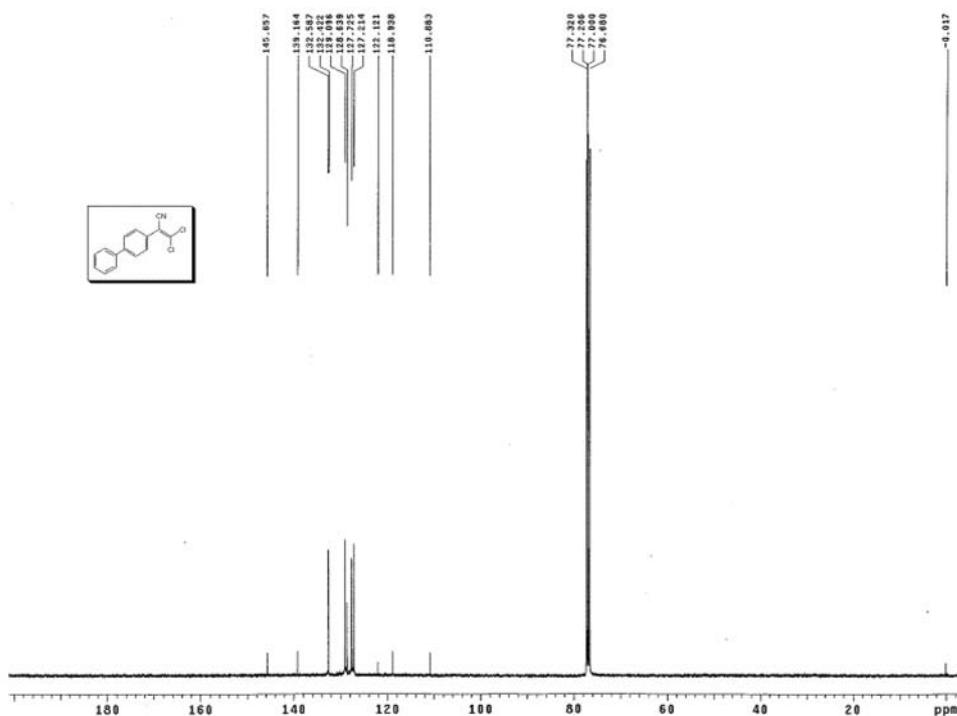


Figure S78. ^{13}C NMR spectrum of 2-(4-biphenyl)-3,3-dibromoacrylonitrile (**2l**).

1,3-Bis(2,2-dibromo-1-cyanovinyl)benzene (2m)

IR (KBr) ν_{max} /cm⁻¹: 3055, 2923, 2200, 1636, 1479, 1433, 1102, 713, 514; ^1H NMR (CDCl_3 , 400 MHz): δ 7.75-7.42 (m, 4H, Ar-H); ^{13}C NMR (CDCl_3 , 100 MHz): δ 133.3, 132.4, 132.3, 132.2, 131.5, 128.5, 128.4.

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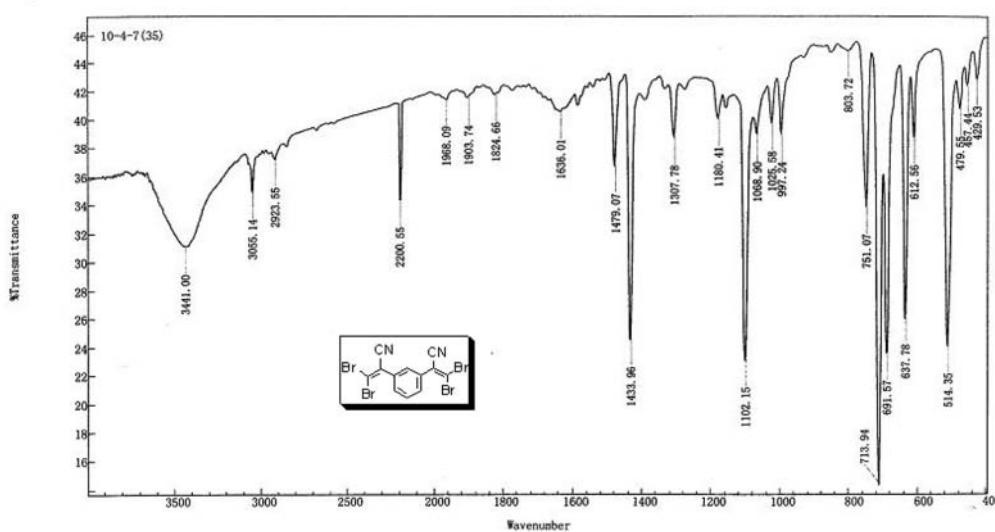


Figure S79. IR spectrum of 1,3-bis(2,2-dibromo-1-cyanovinyl)benzene (**2m**).

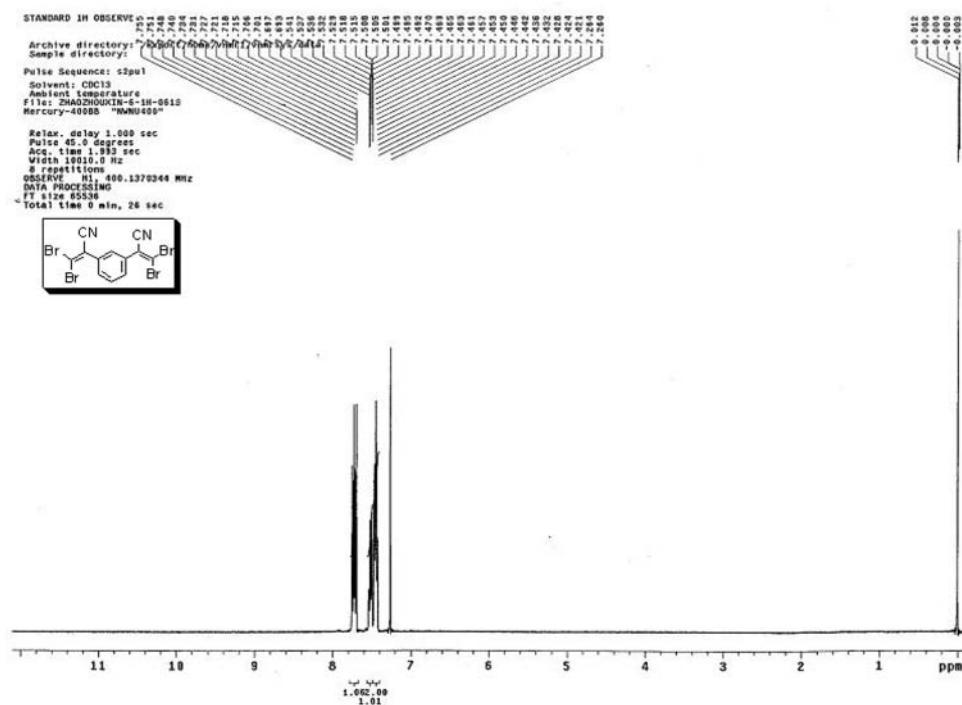


Figure S80. ¹H NMR spectrum of 1,3-bis(2,2-dibromo-1-cyanovinyl)benzene (**2m**).

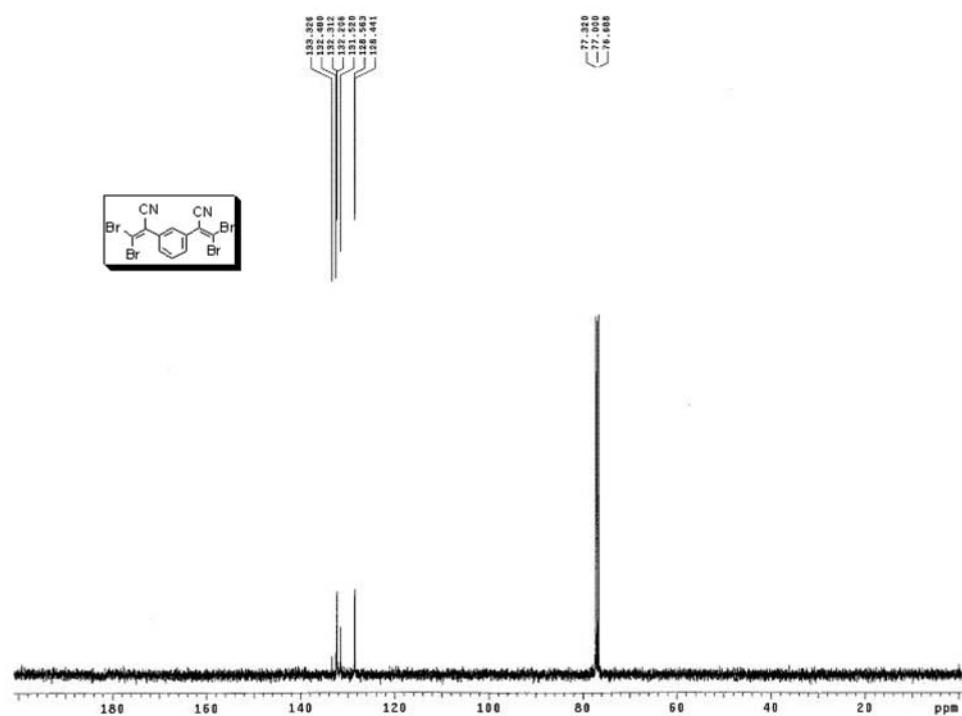


Figure S81. ¹³C NMR spectrum of 1,3-bis(2,2-dibromo-1-cyanovinyl)benzene (**2m**).

2-(Furan-2-yl)-3,3-dibromoacrylonitrile (2n)

IR (KBr) ν_{max} /cm⁻¹: 3153, 2227, 1634, 1534, 1476, 1030, 850, 750; ¹H NMR (400 MHz, CDCl₃): δ 7.58 (d, 1H, J 1.6Hz, Fu-H), 7.08 (d, 1H, J 4.0 Hz, Fu-H), 6.54 (dd, 1H, J 3.6Hz, J 1.6Hz, Fu-H); ¹³C NMR (CDCl₃, 100 MHz): δ 145.9, 144.2, 115.3, 114.5, 113.5, 112.1, 103.7.

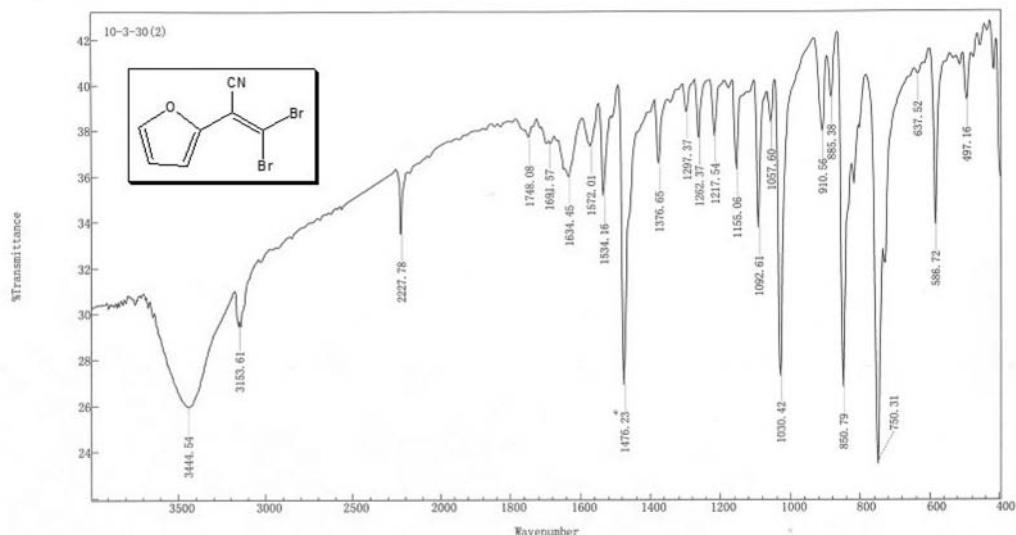
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Figure S82. IR spectrum of 2-(furan-2-yl)-3,3-dibromoacrylonitrile (**2n**).

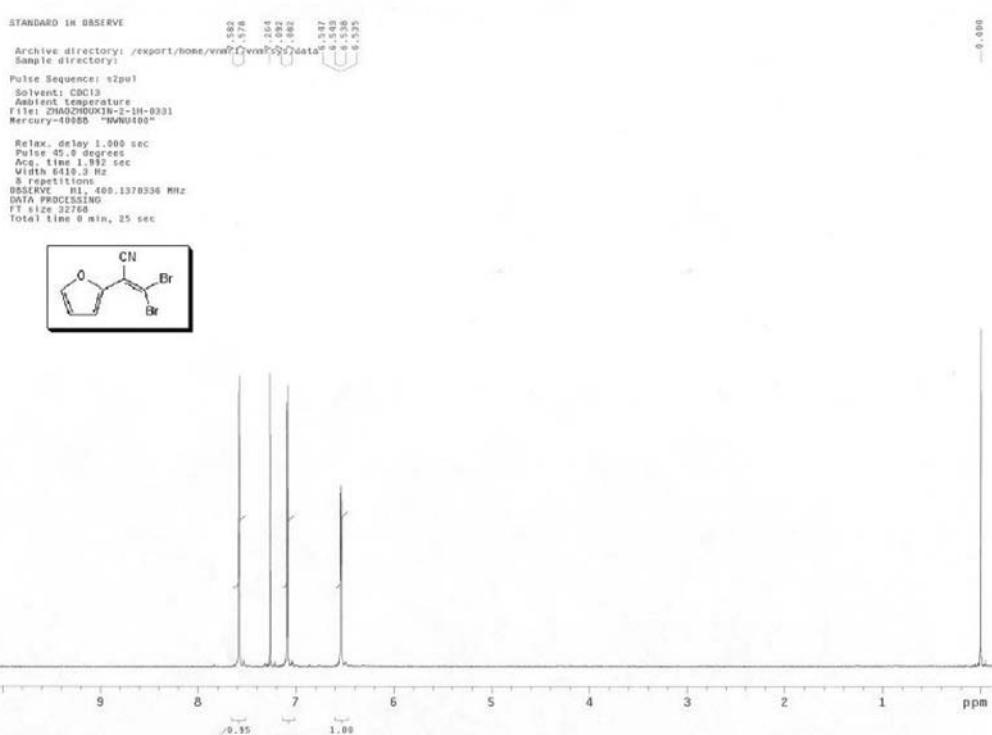


Figure S83. ¹H NMR spectrum of 2-(furan-2-yl)-3,3-dibromoacrylonitrile (**2n**).

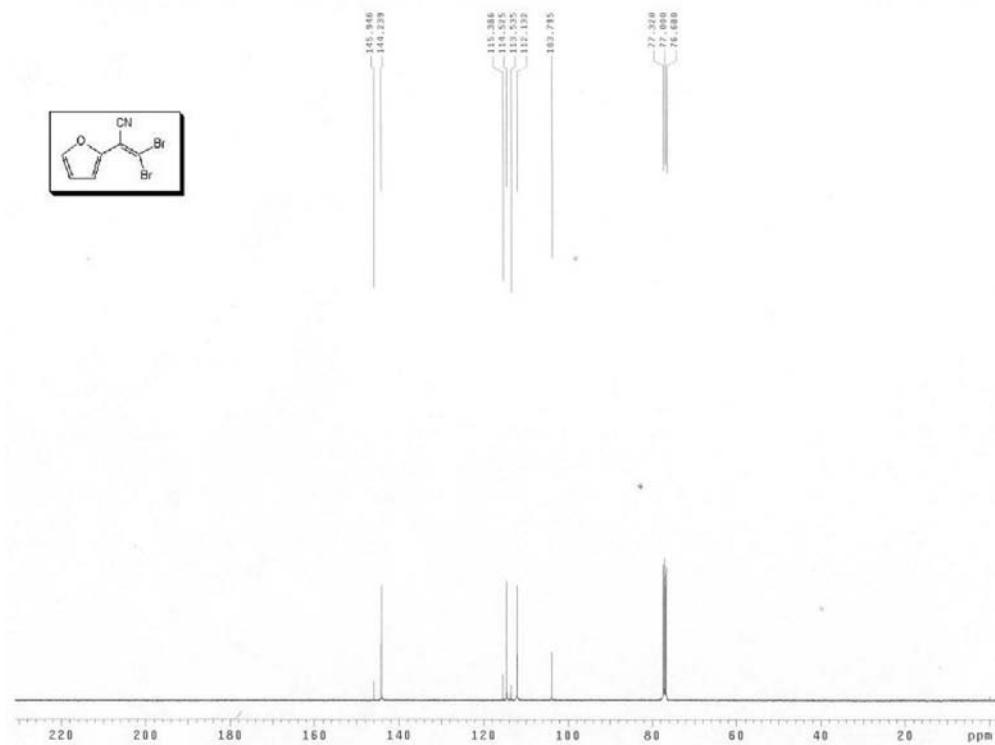


Figure S84. ¹³C NMR spectrum of 2-(furan-2-yl)-3,3-dibromoacrylonitrile (**2n**).