

Synthesis of new pyridines with sulfonamide moiety via a cooperative vinylogous anomeric-based oxidation mechanism in the presence of a novel quinoline-based dendrimer-like ionic liquid

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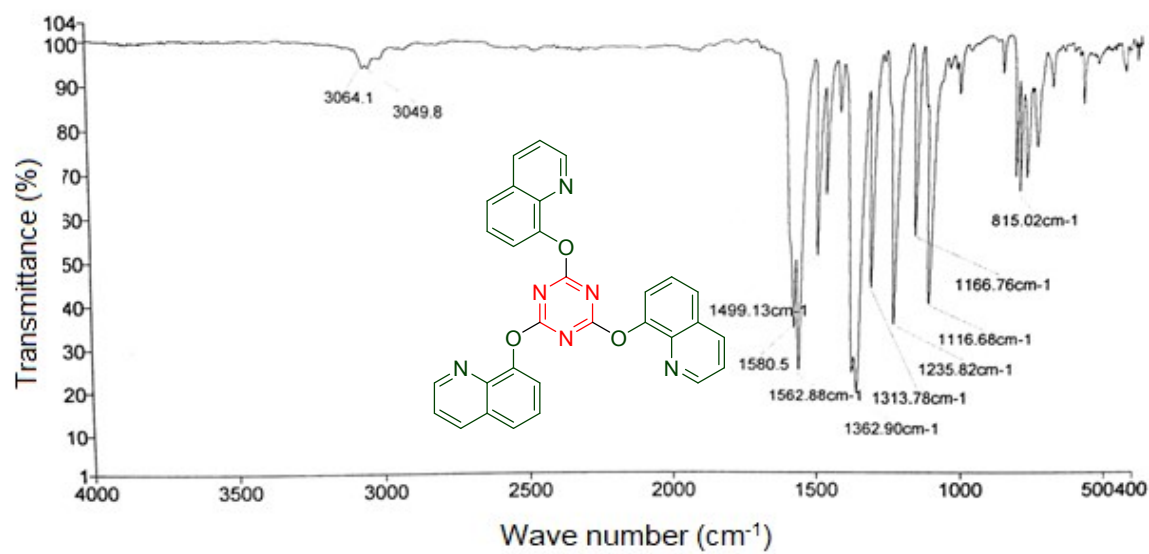
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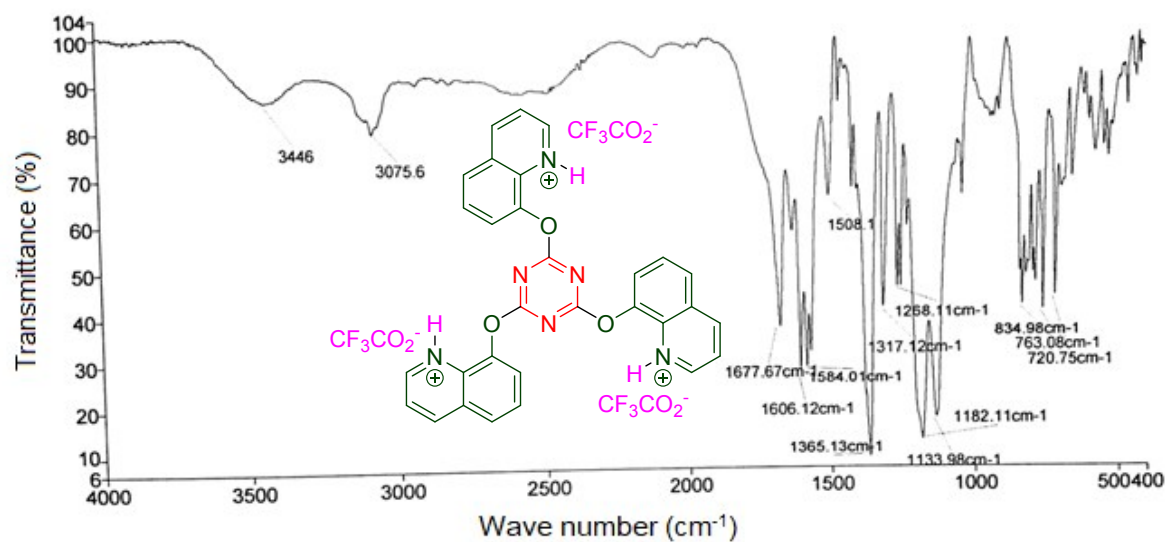
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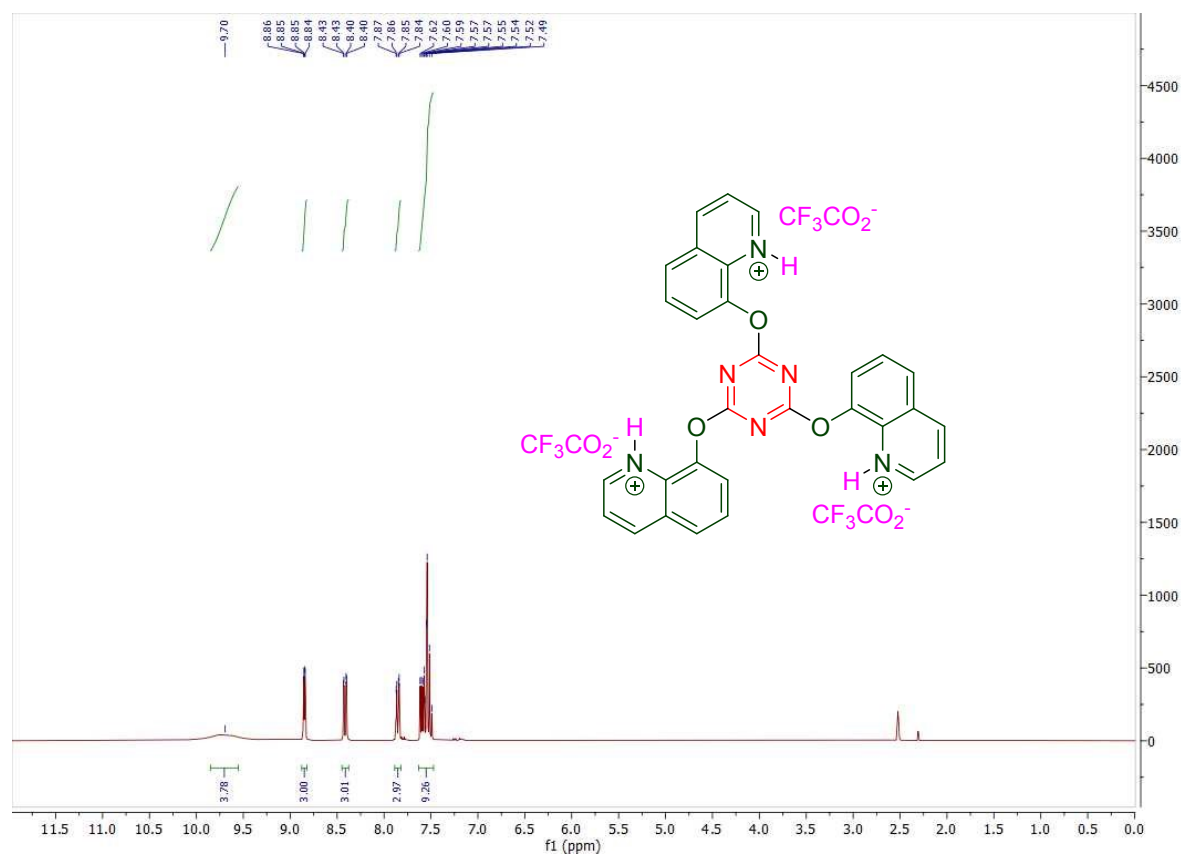
1: FT-IR spectrum of 2,4,6-tris(quinolin-8-yloxy)-1,3,5-triazine



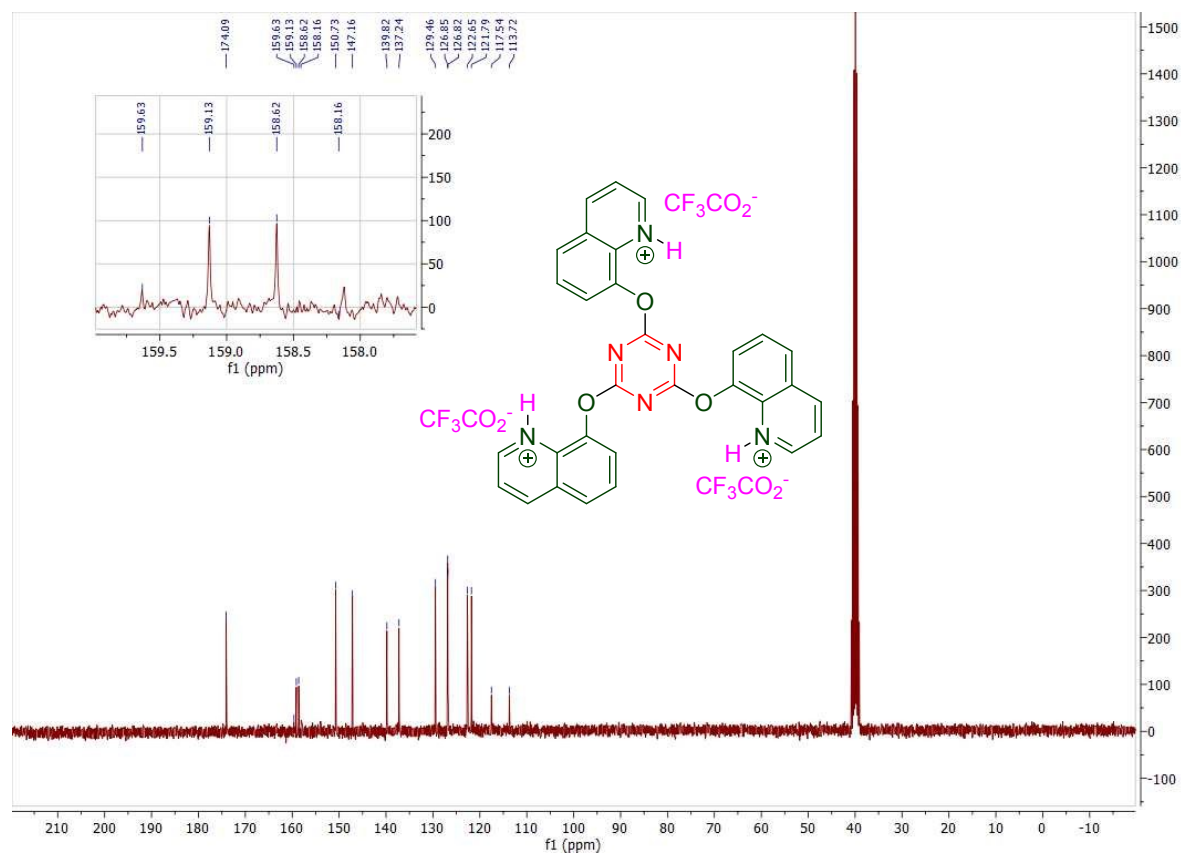
2: ¹H NMR spectrum of TQoxyTtriFA.



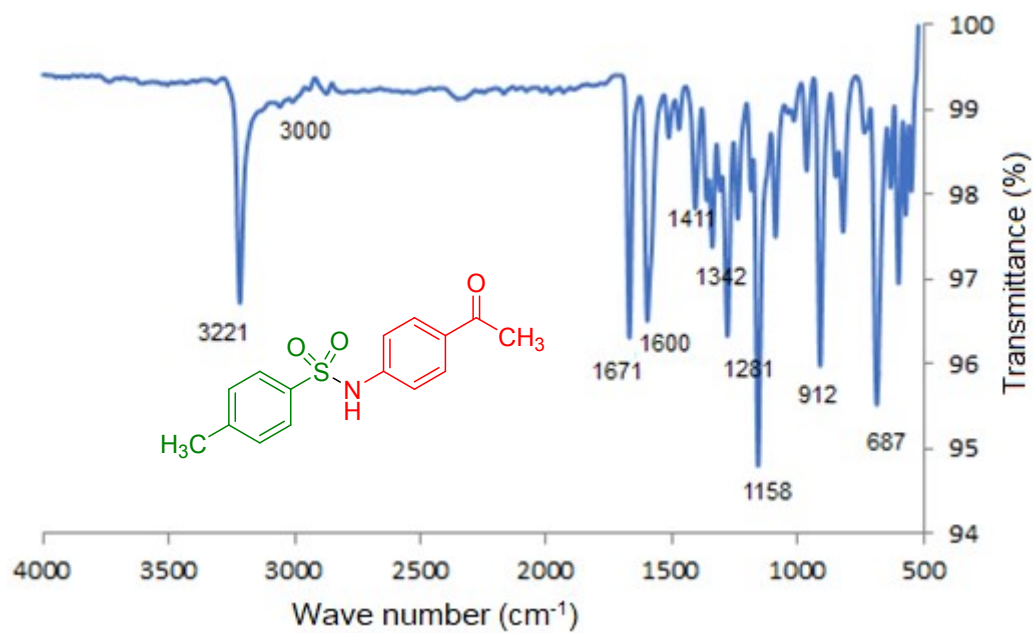
3: ^1H NMR spectrum of TQoxyTtriFA.



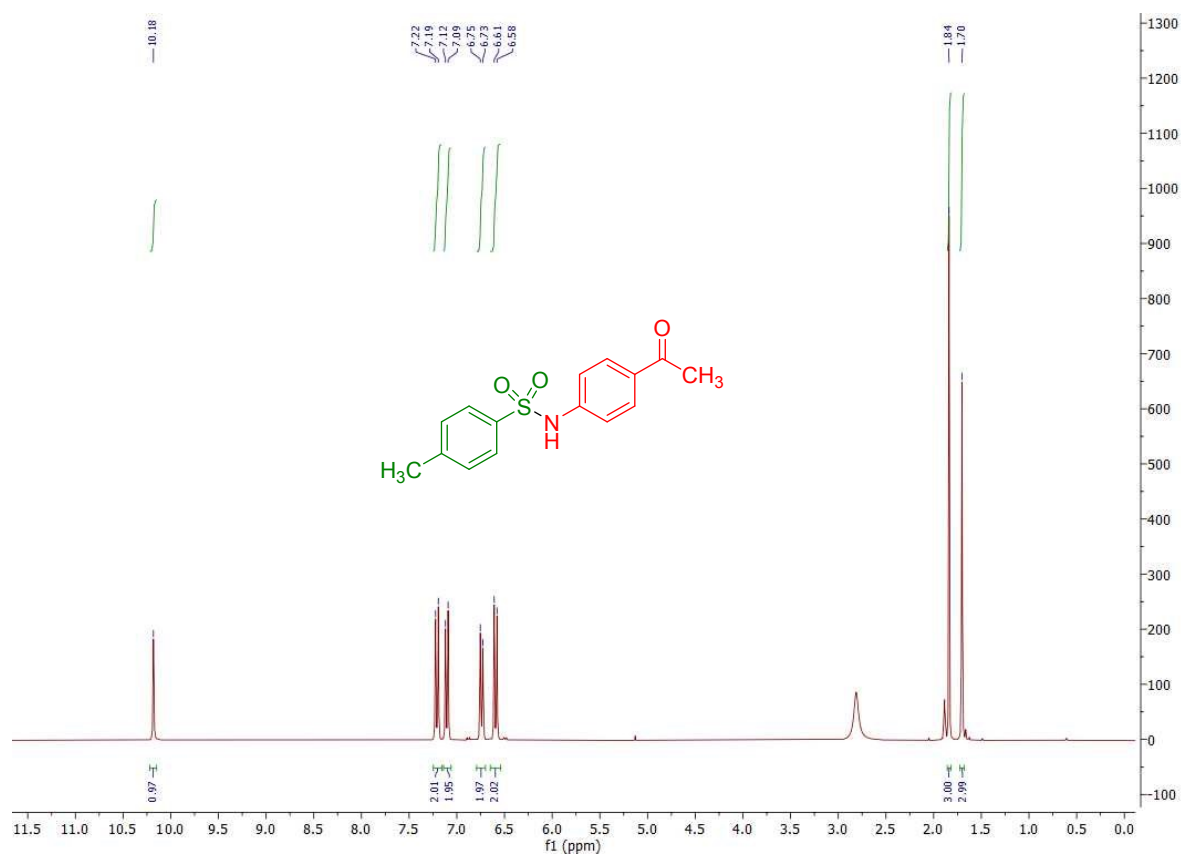
4: ^{13}C NMR spectrum of TQoxyTtriFA.



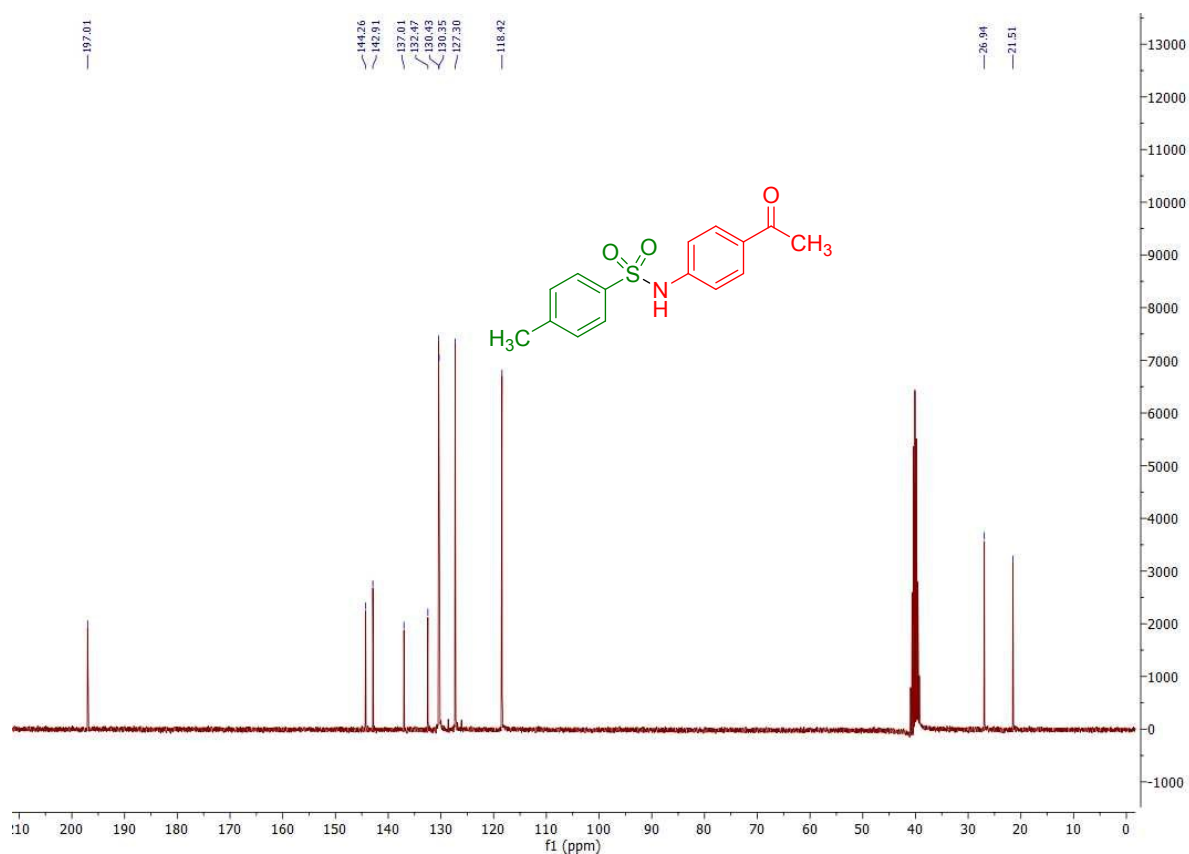
5: FT-IR spectrum of *N*-(4-acetylphenyl)-4-methylbenzenesulfonamide.



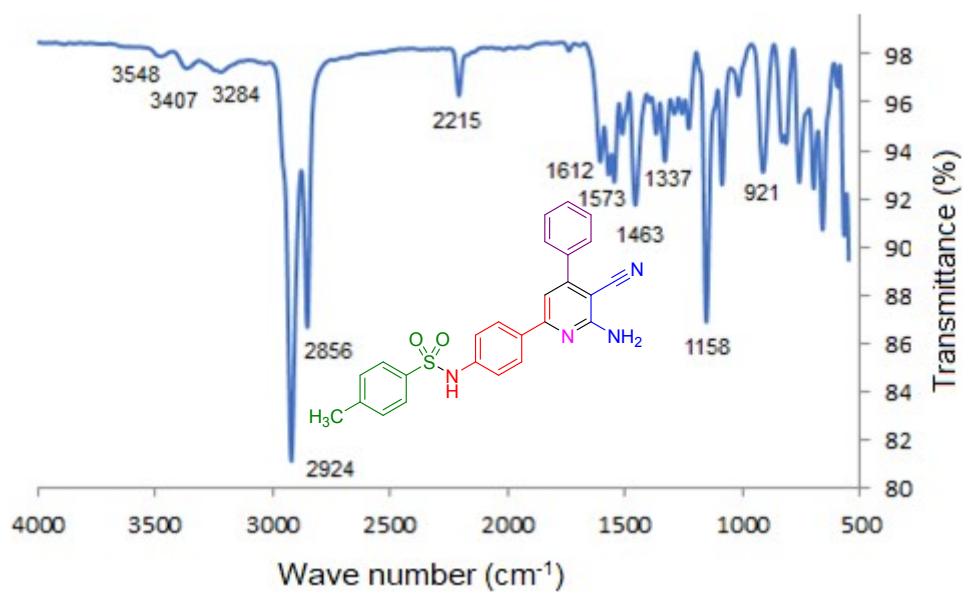
6: ¹H NMR spectrum of *N*-(4-acetylphenyl)-4-methylbenzenesulfonamide.



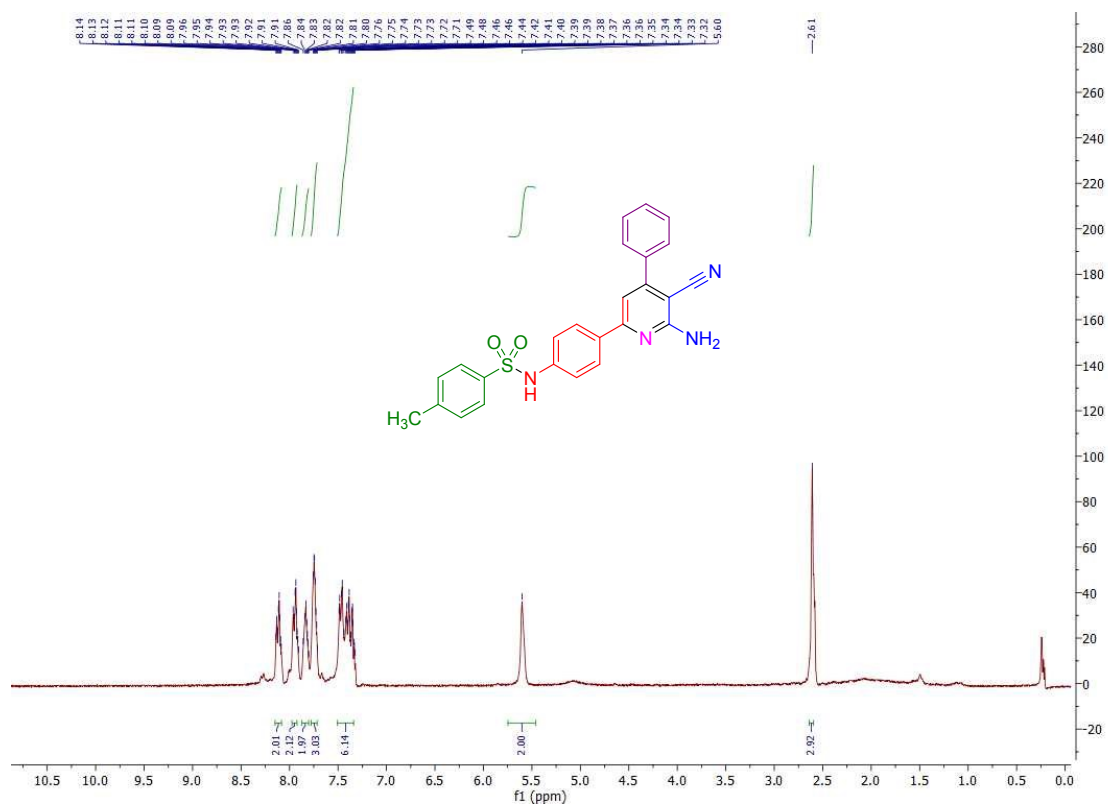
7: ^{13}C NMR spectrum of *N*-(4-acetylphenyl)-4-methylbenzenesulfonamide.

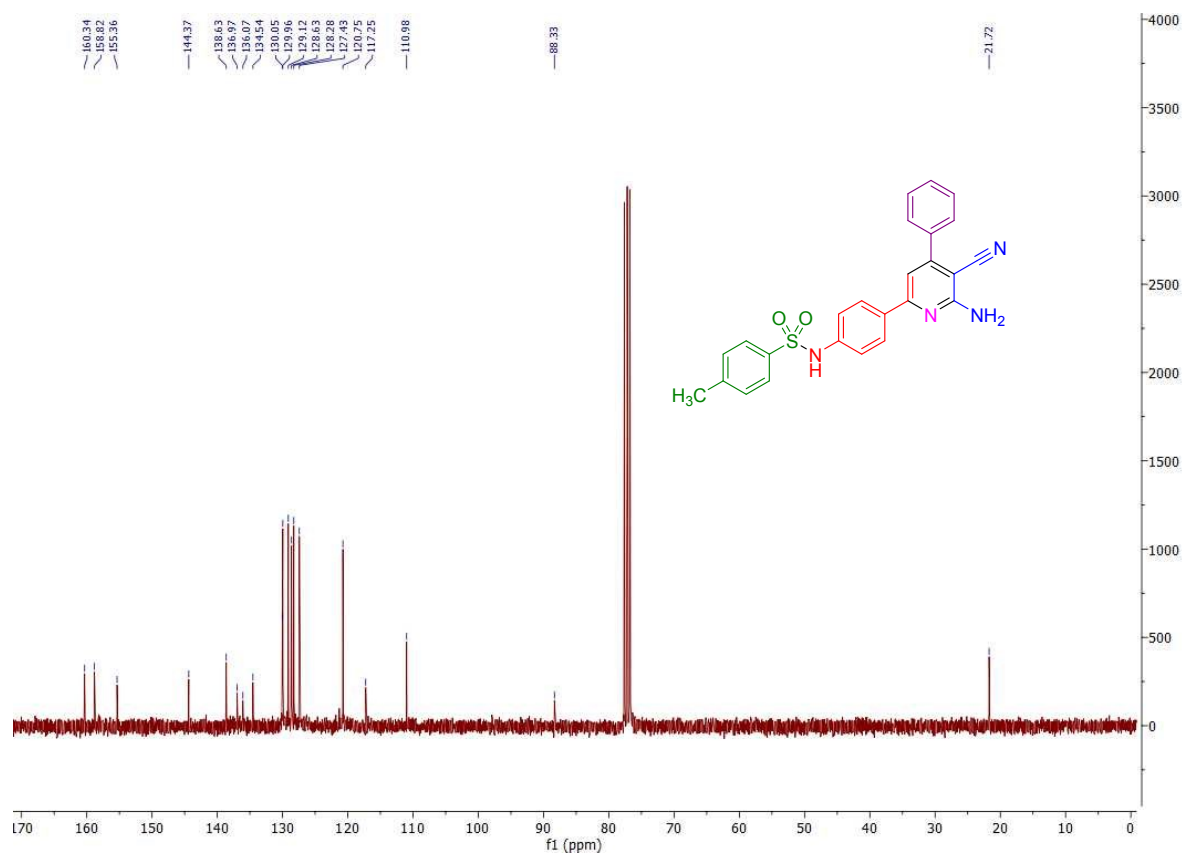


8: FT-IR spectrum of *N*-(4-(6-amino-5-cyano-4-phenylpyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1a).

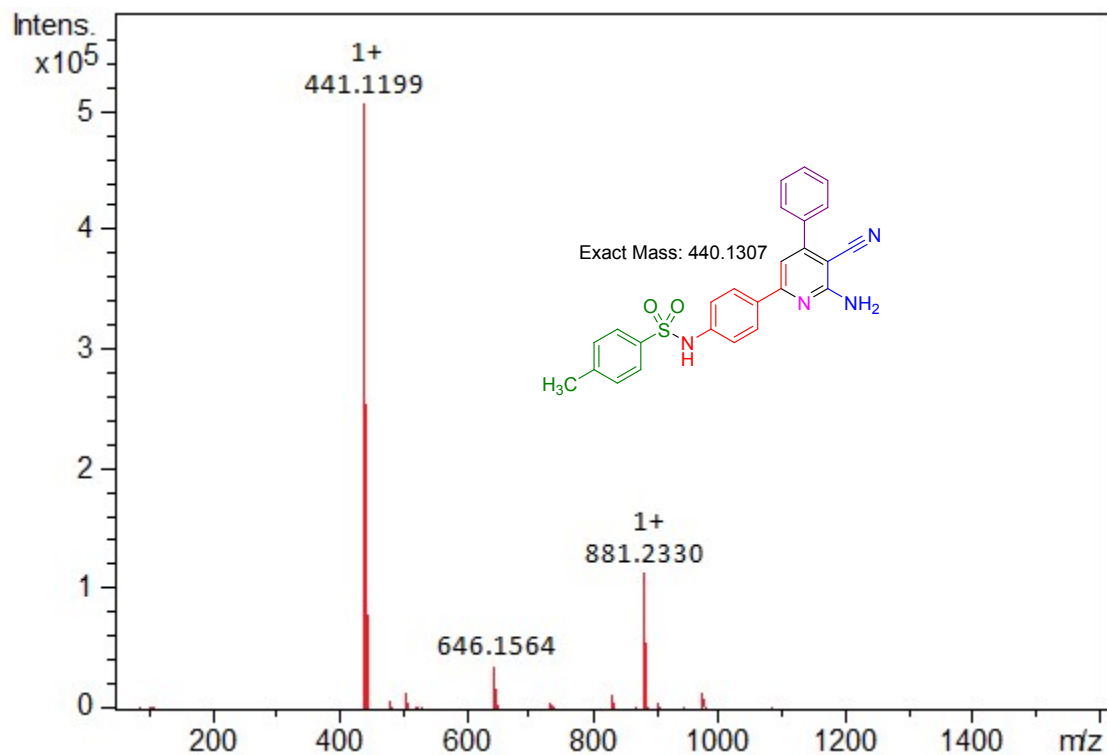


10: ¹³C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-phenylpyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1a).

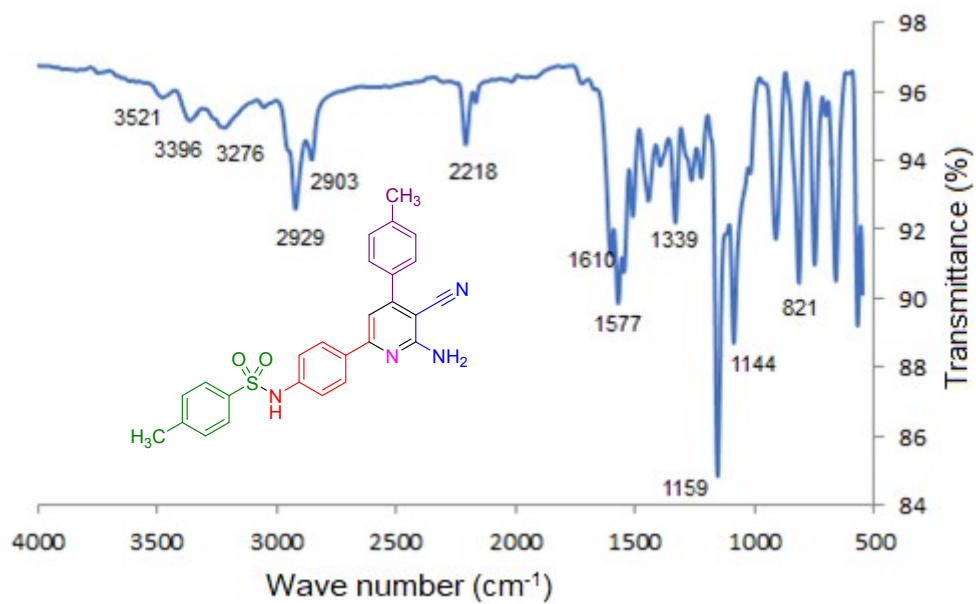




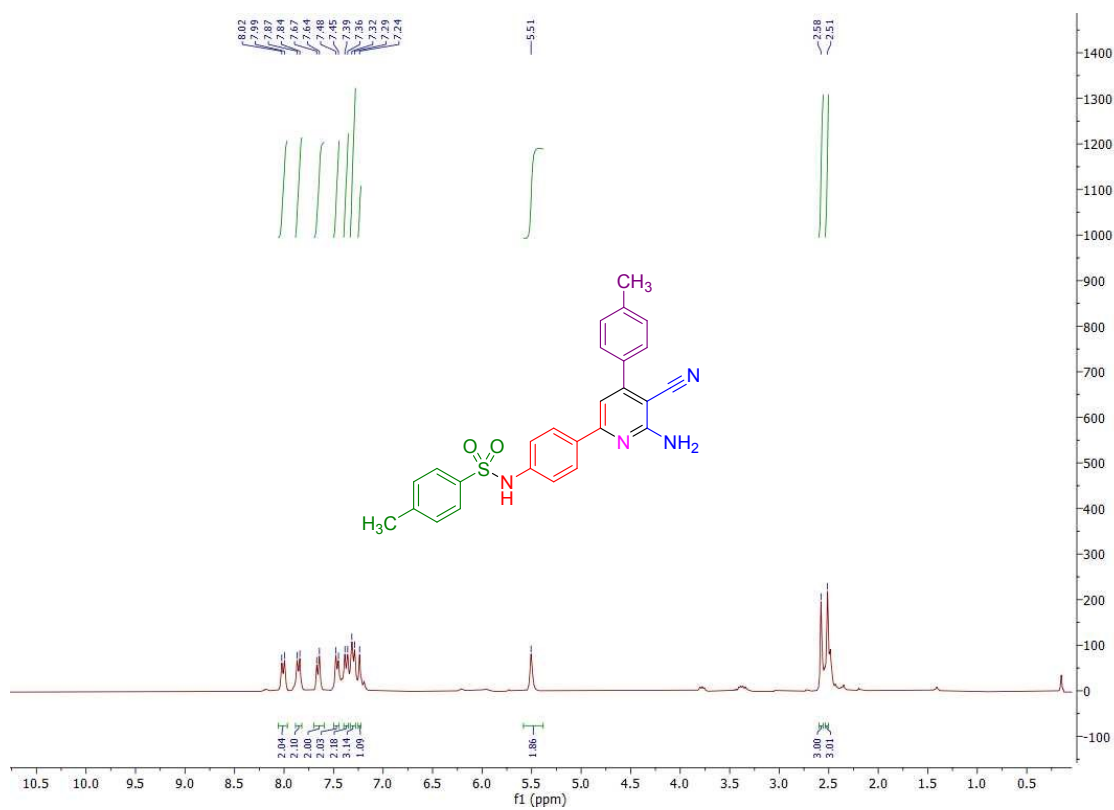
11: HR mass spectrum of *N*-(4-(6-amino-5-cyano-4-phenylpyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1a).



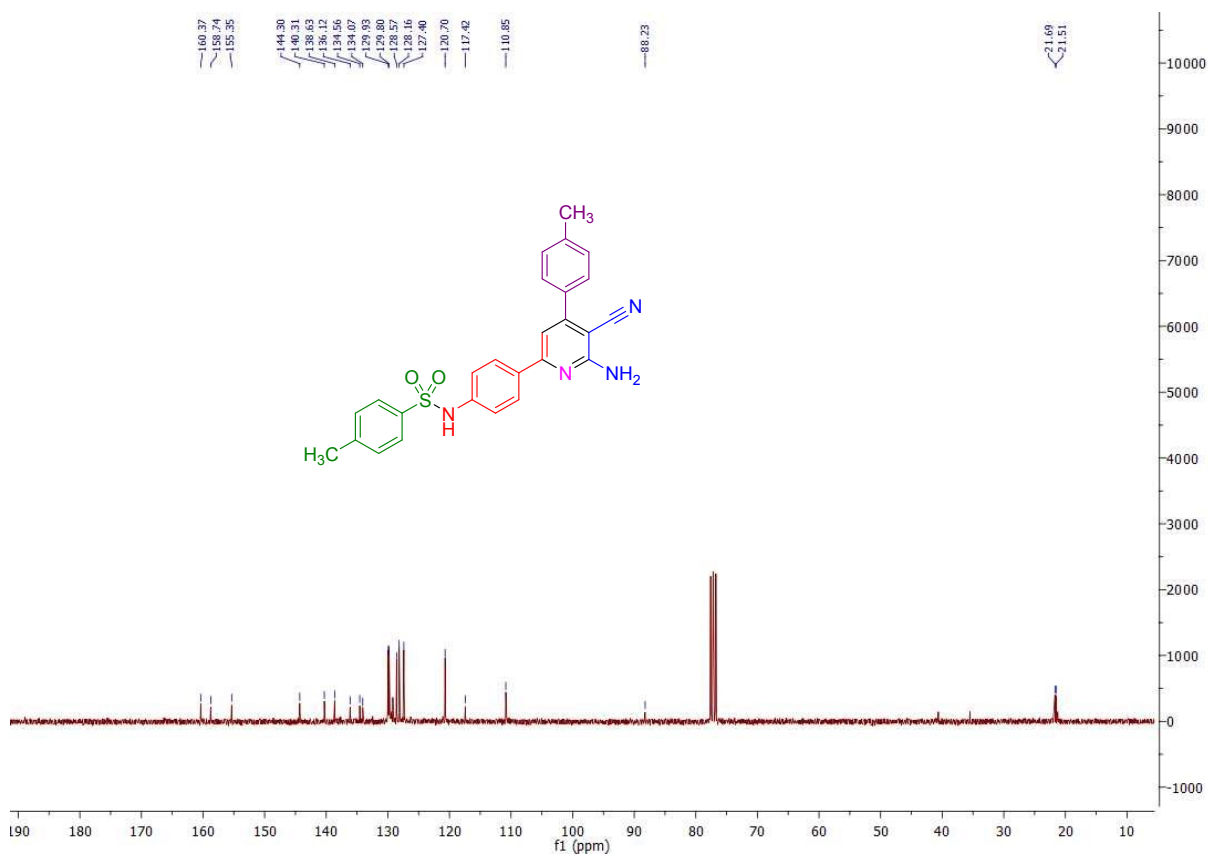
12: FT-IR spectrum of *N*-(4-(6-amino-5-cyano-4-(*p*-tolyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1b).



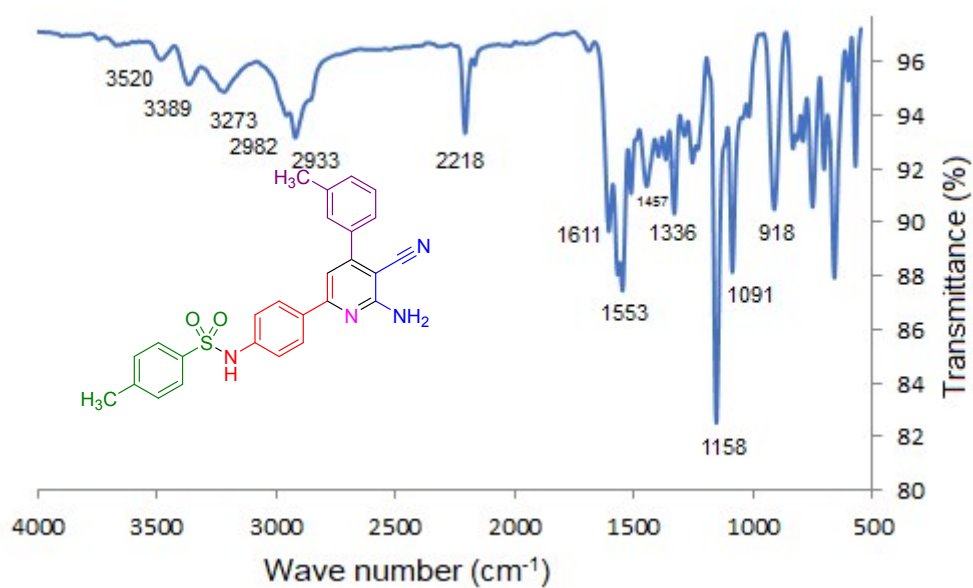
13: ¹H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(*p*-tolyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1b).



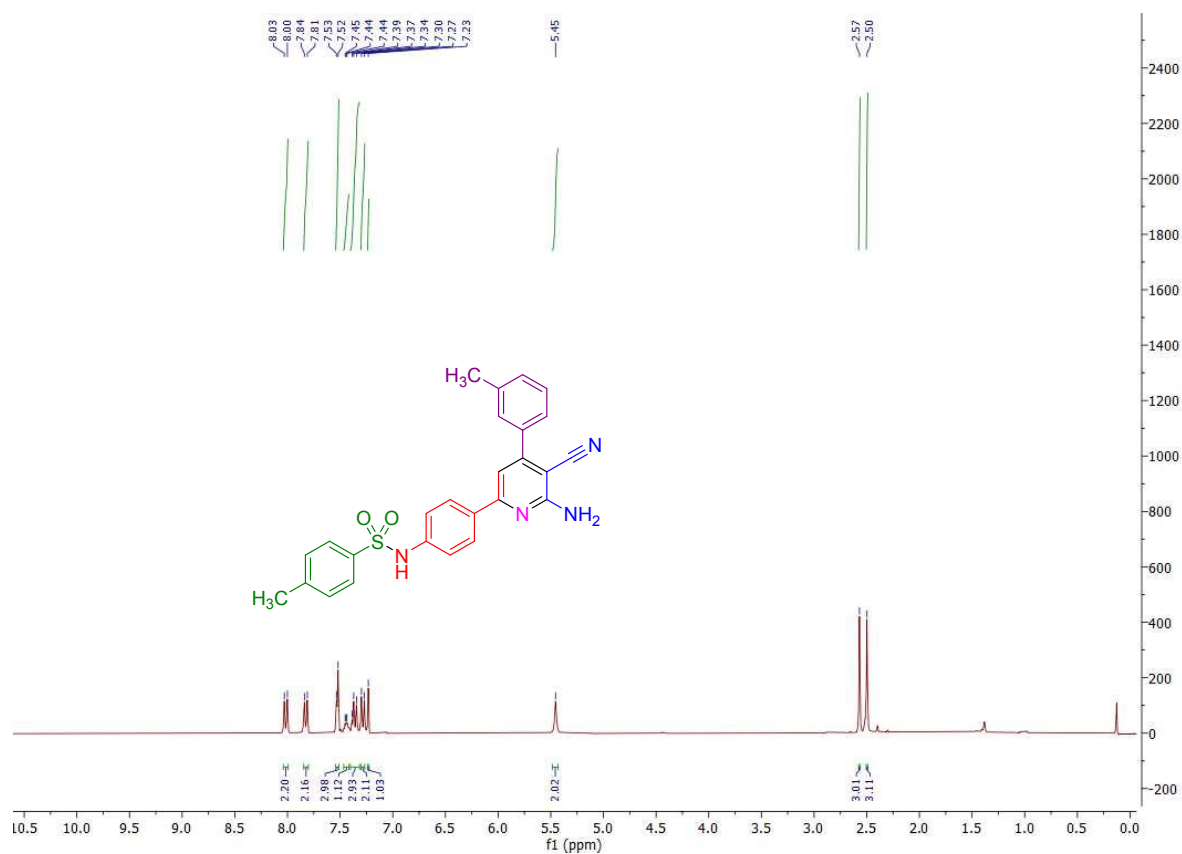
14: ^{13}C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(*p*-tolyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1b).



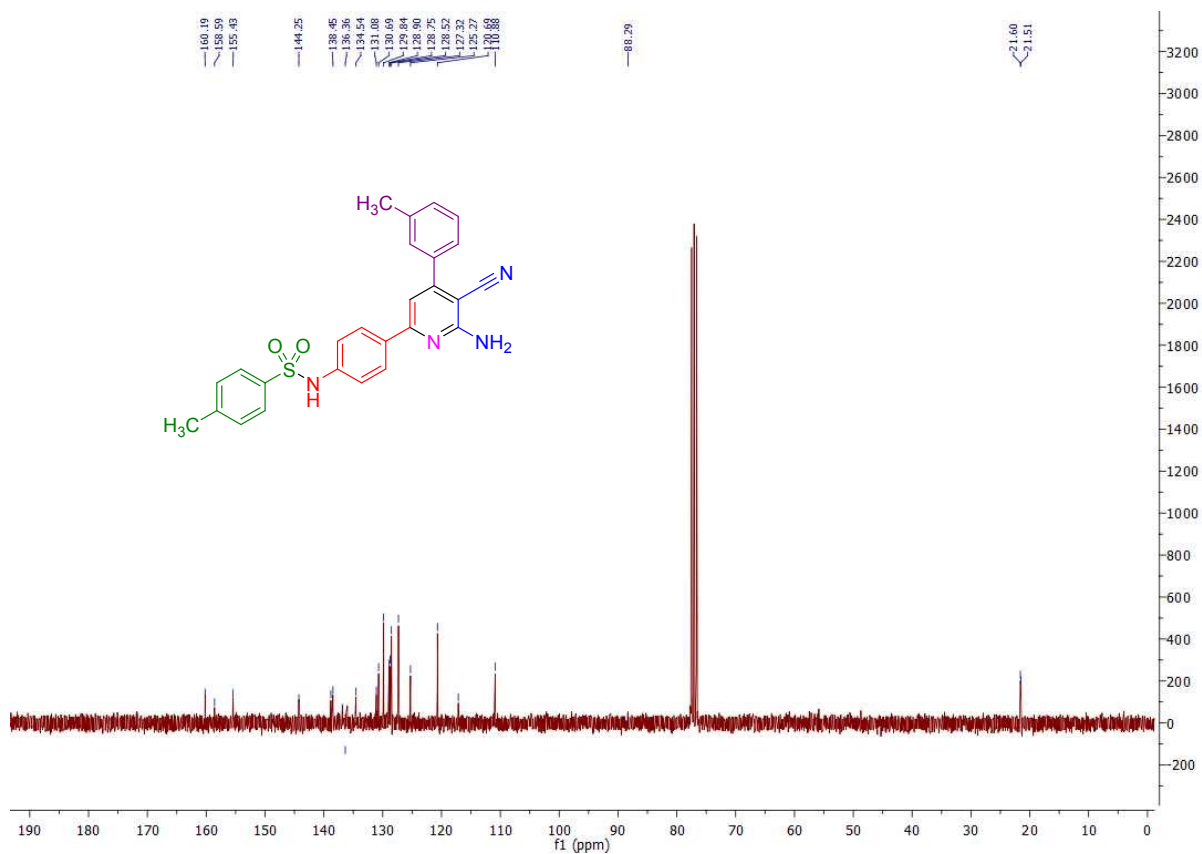
15: FT-IR spectrum of *N*-(4-(6-amino-5-cyano-4-(*m*-tolyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1c).



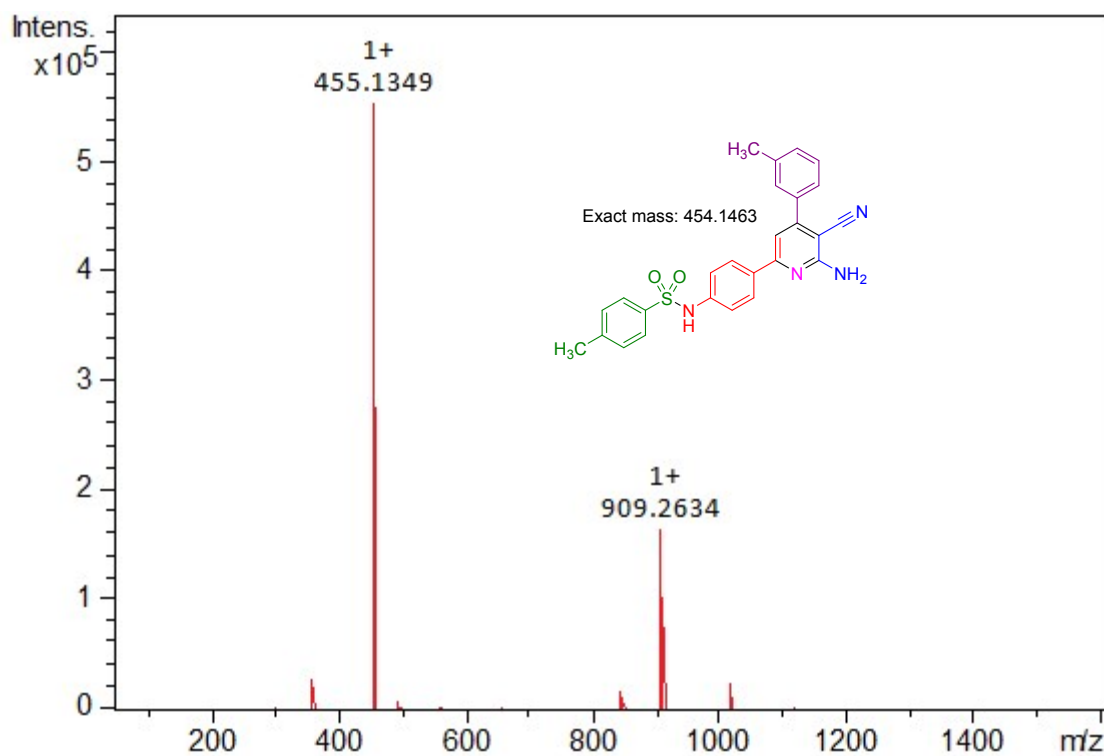
16: ^1H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(*m*-tolyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1c).



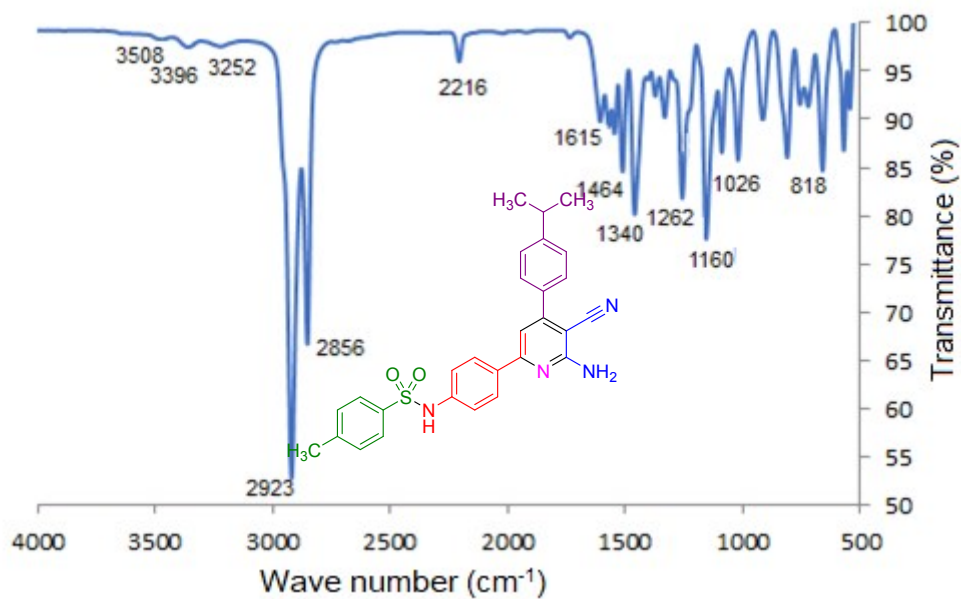
17: ¹³C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(*m*-tolyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1c).



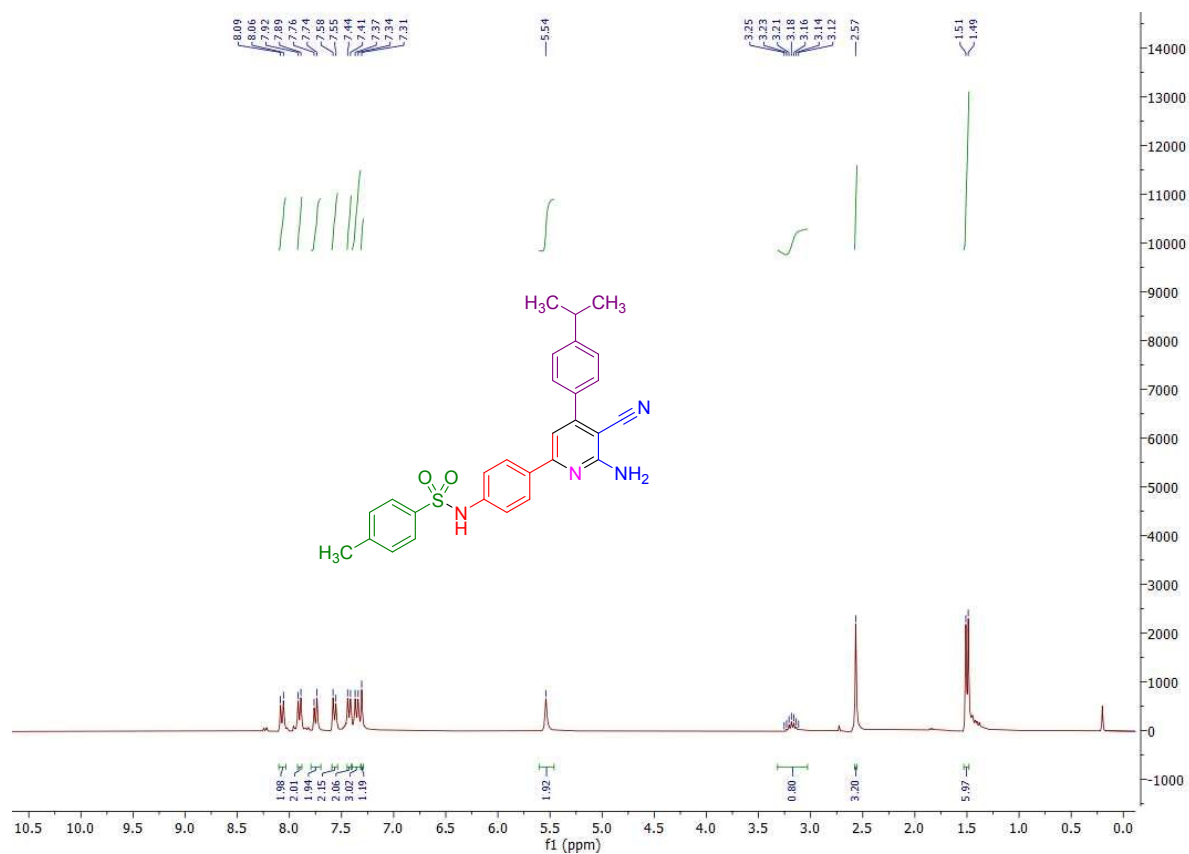
18: HR mass spectrum of *N*-(4-(6-amino-5-cyano-4-(*m*-tolyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (**1c**).



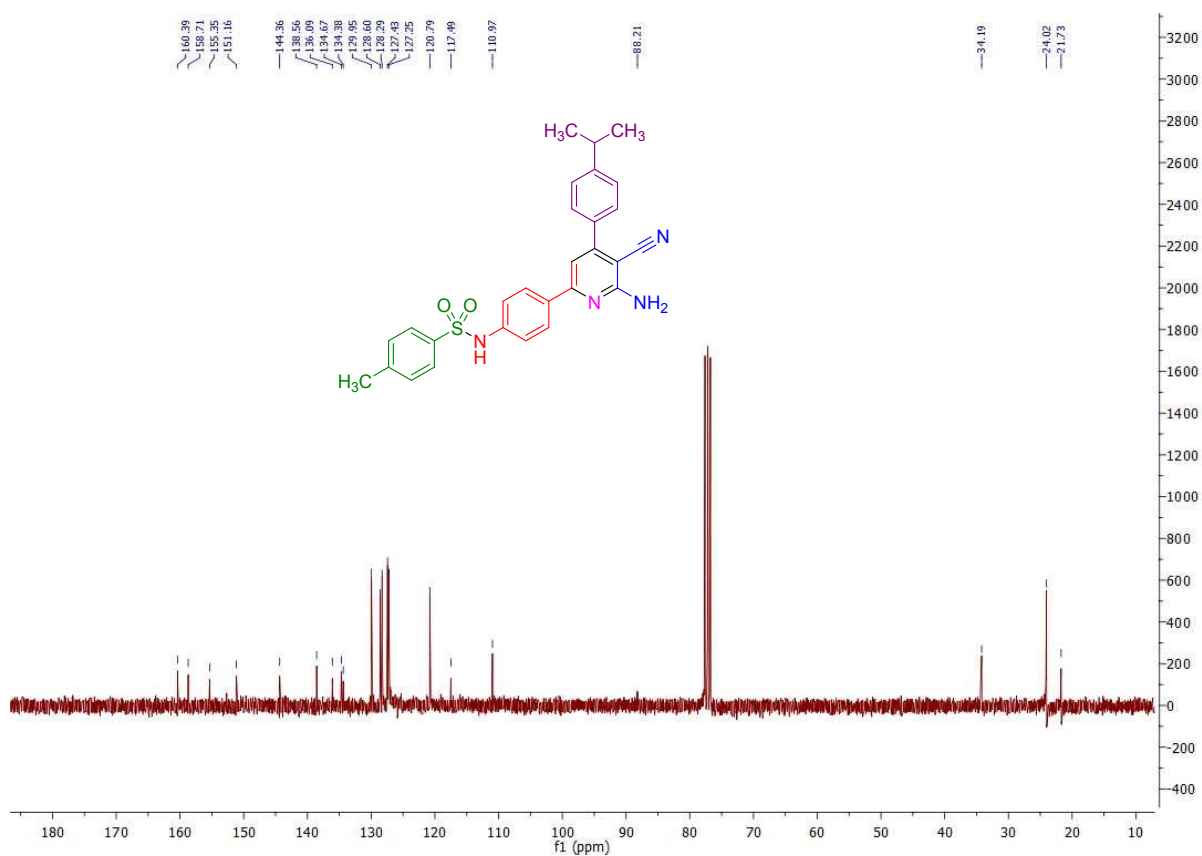
19: FT-IR spectrum of *N*-(4-(6-amino-5-cyano-4-(4-isopropylphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (**1d**).



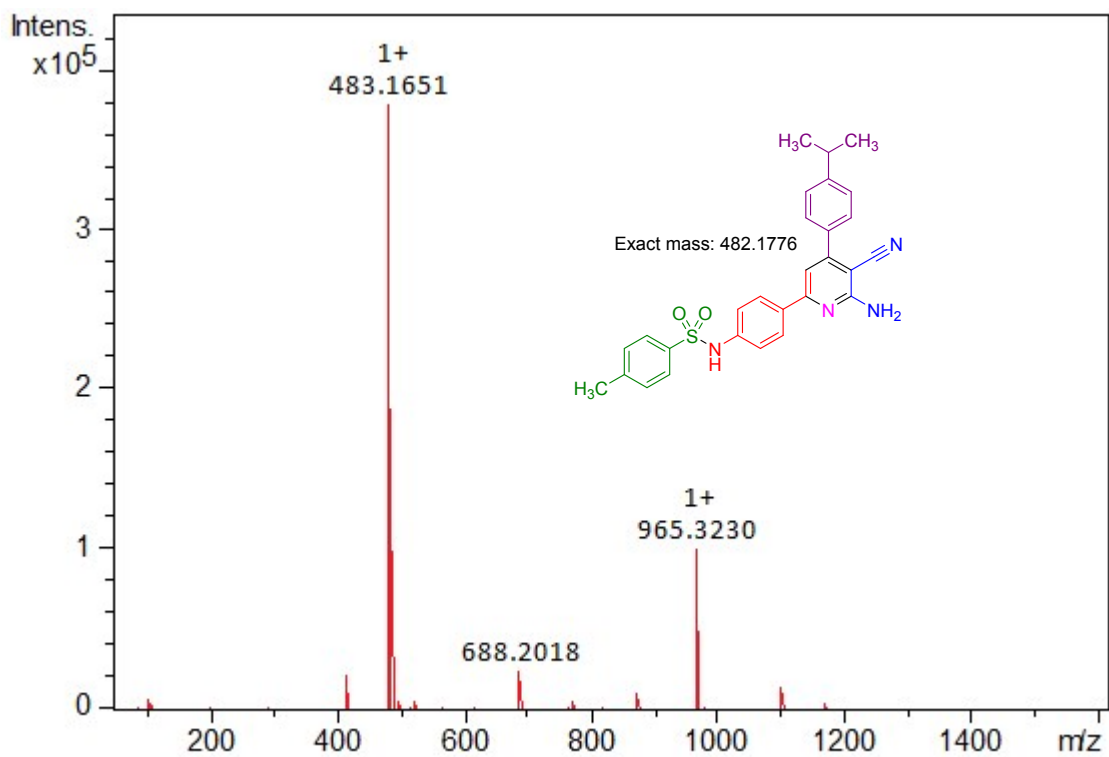
20: ^1H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(4-isopropylphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1d).



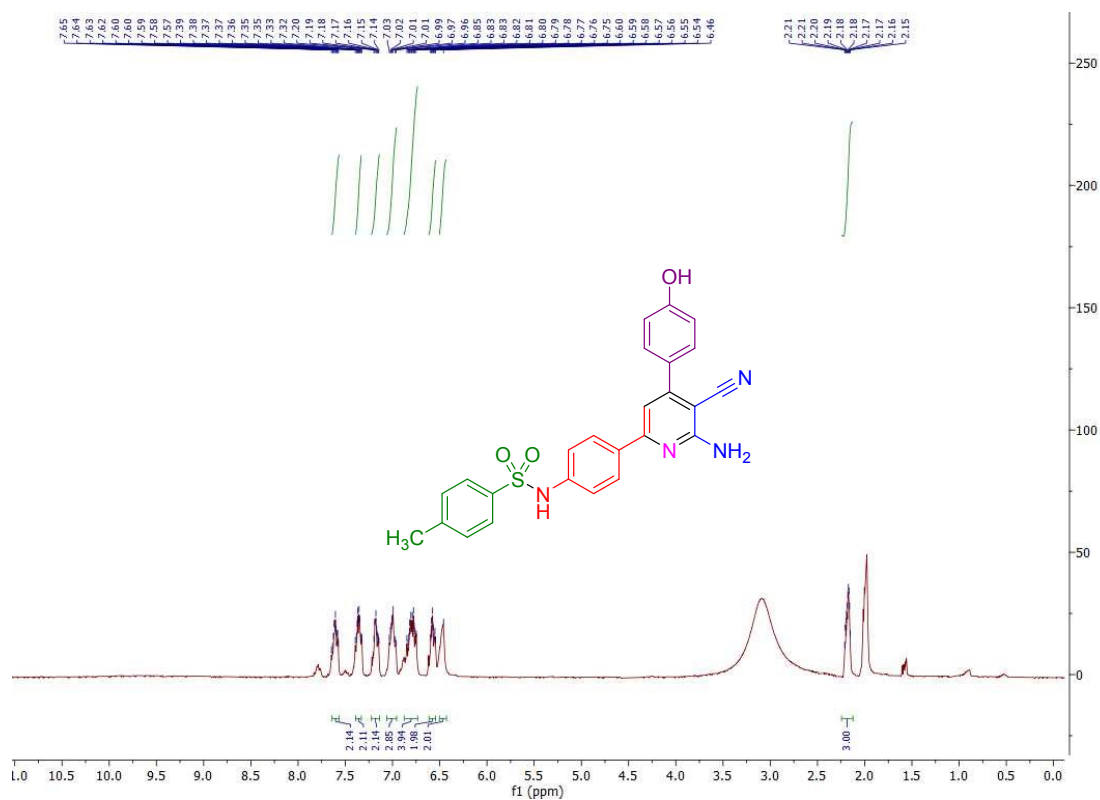
21: ^{13}C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(4-isopropylphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1d).



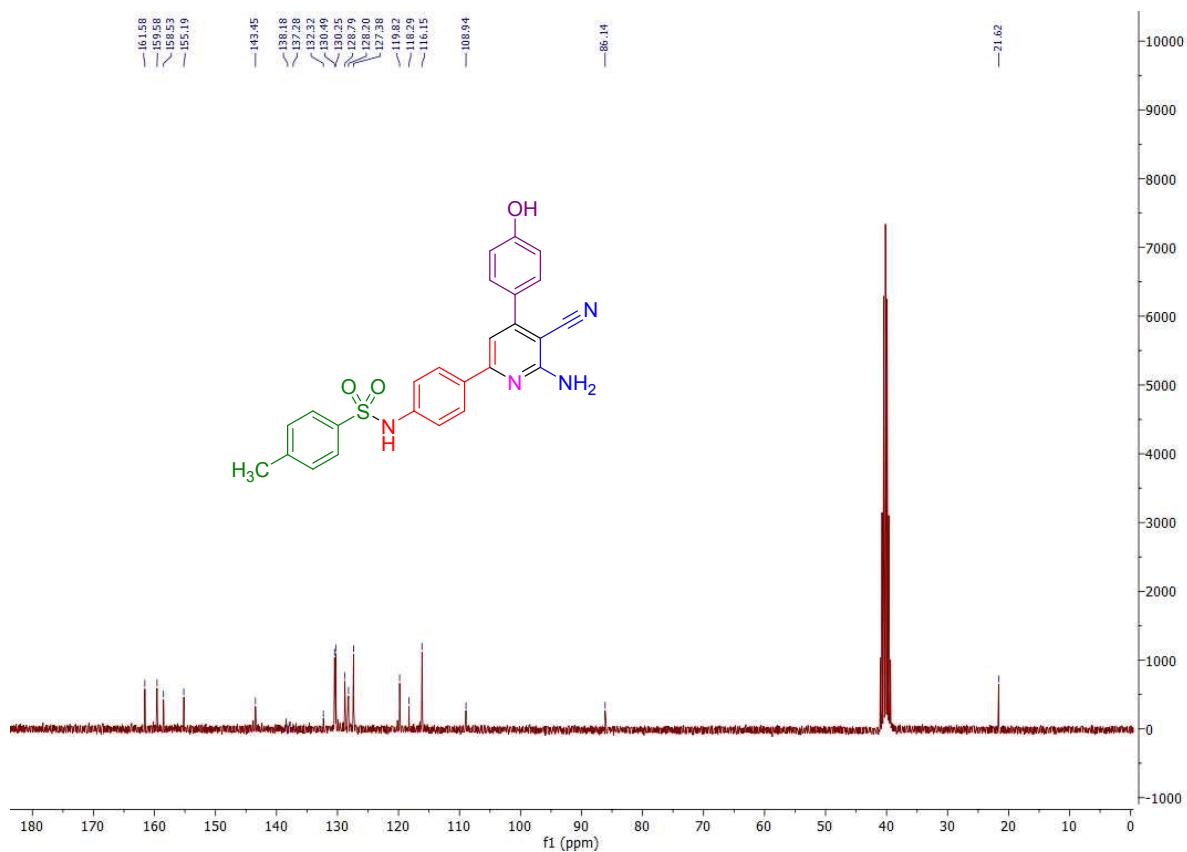
22: HR mass spectrum of *N*-(4-(6-amino-5-cyano-4-(4-isopropylphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1d).



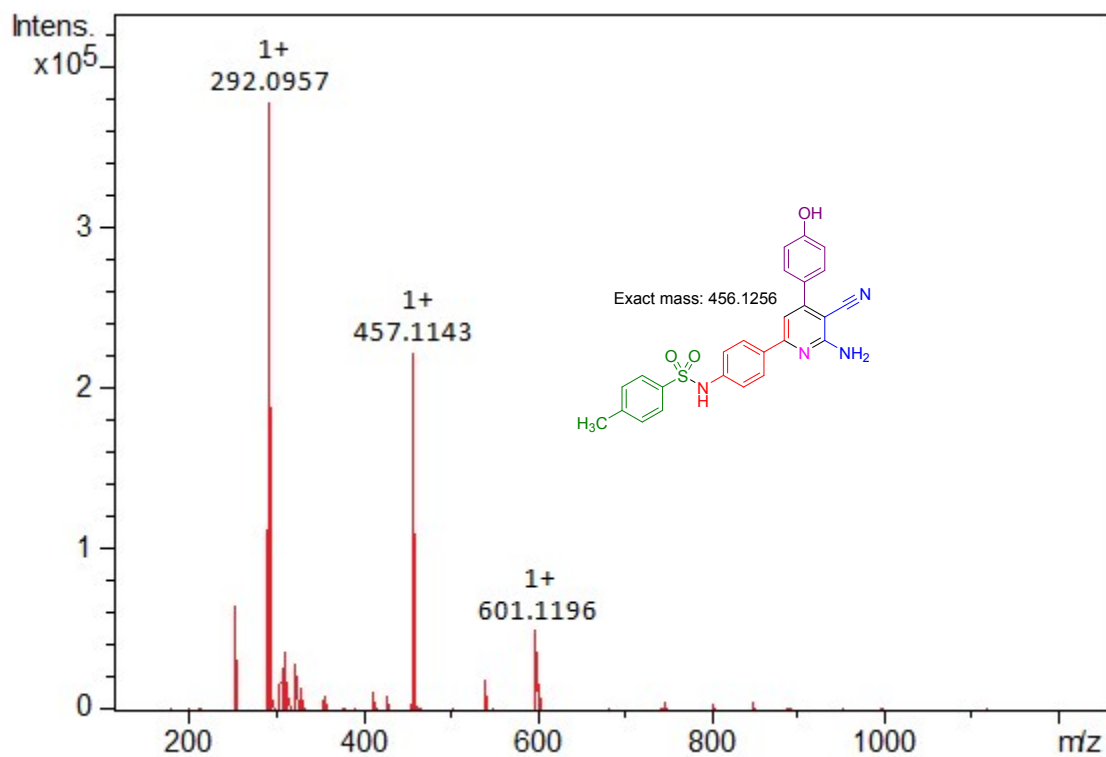
23: ^1H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(4-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1e).



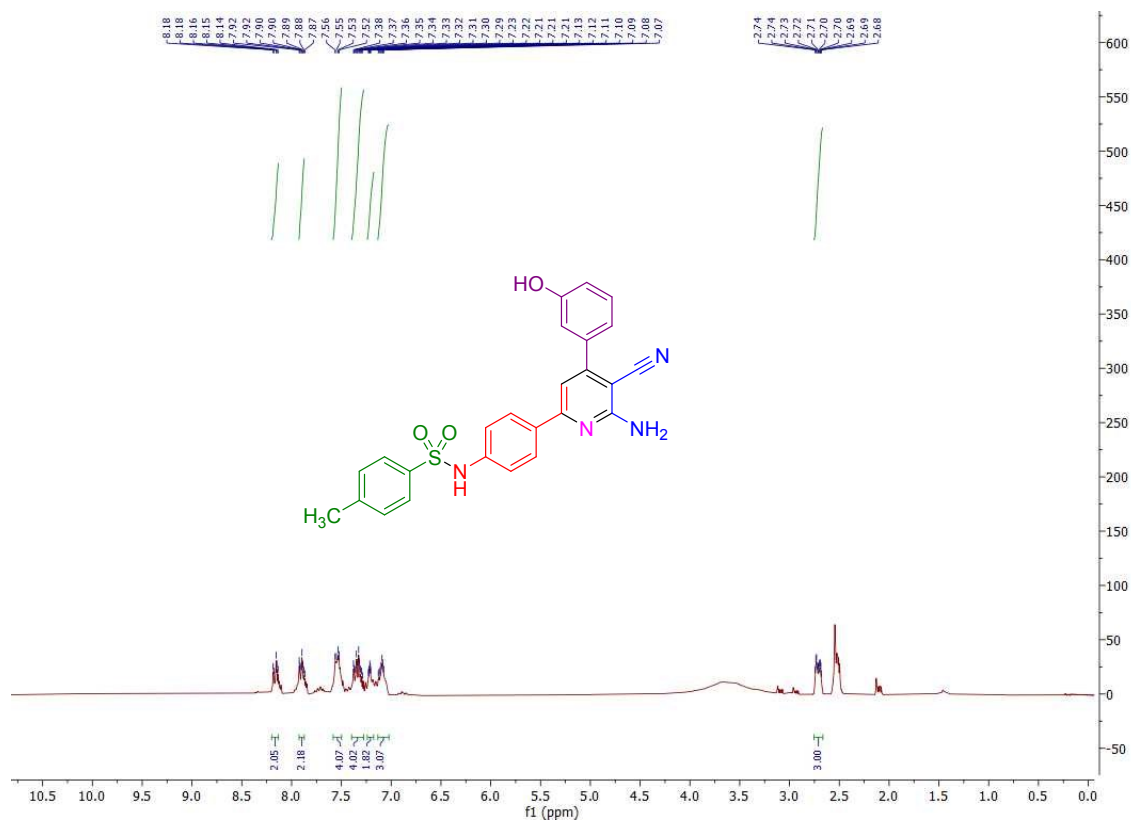
24: ^{13}C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(4-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1e).



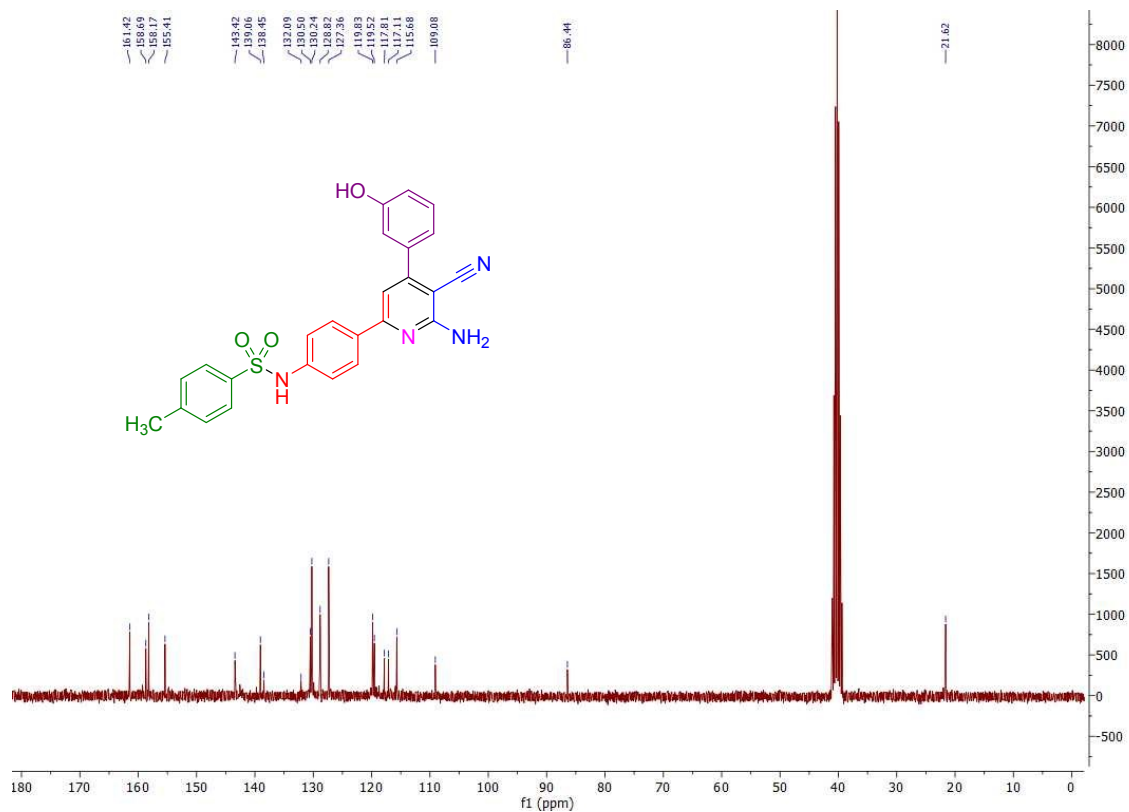
25: HR mass spectrum of *N*-(4-(6-amino-5-cyano-4-(4-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1e).



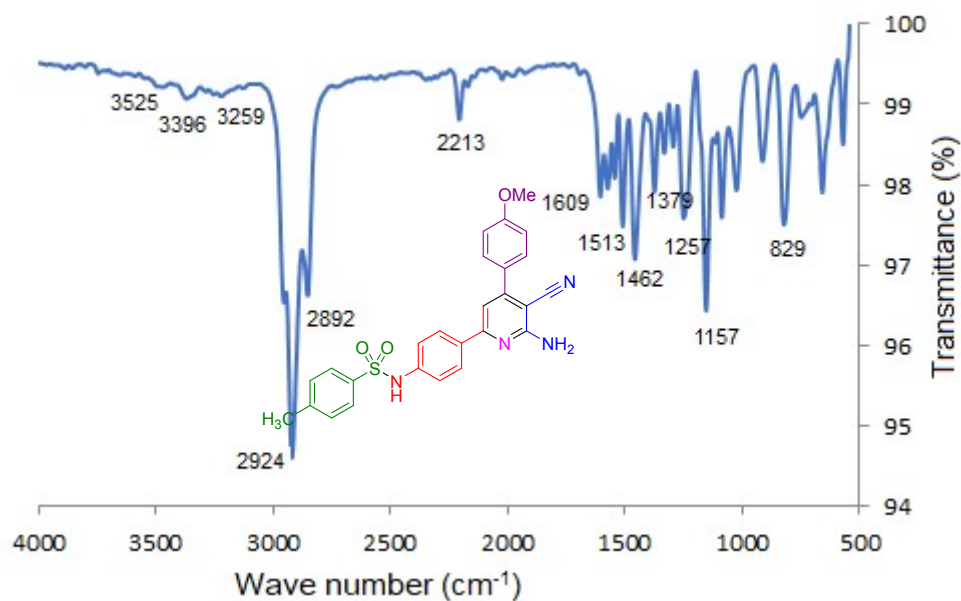
26: ¹H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(3-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1f).



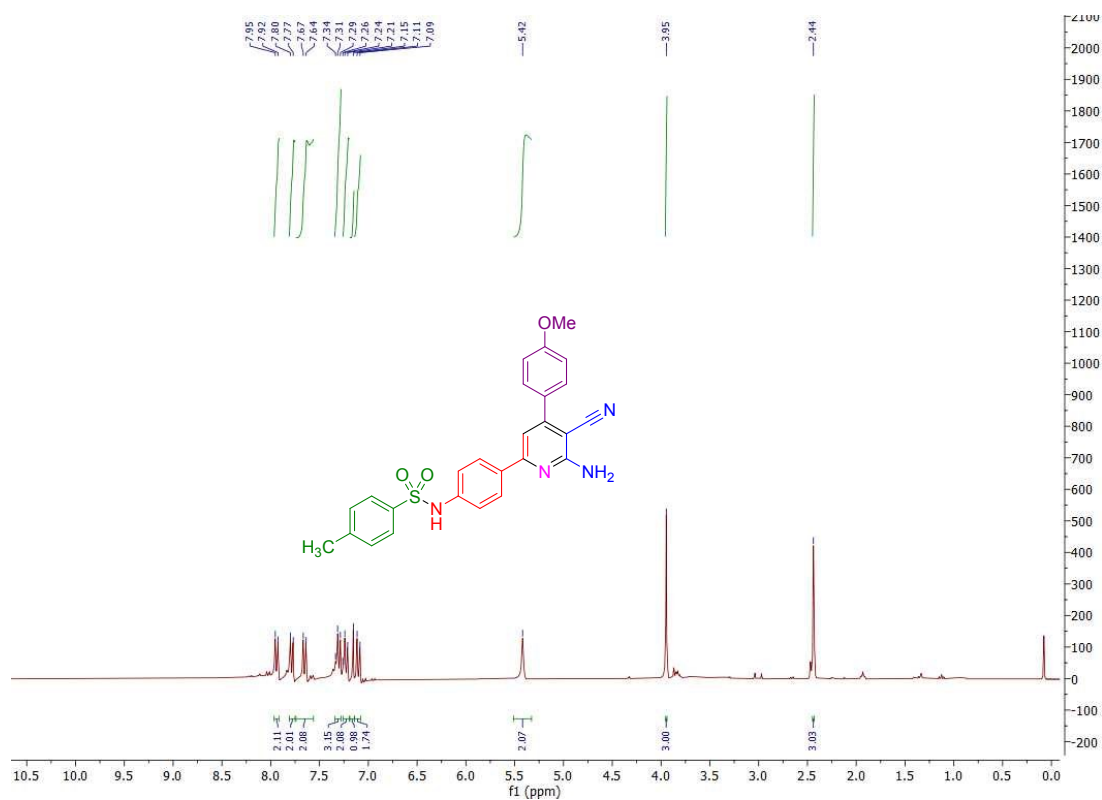
27: ¹³C NMR spectrum of N-(4-(6-amino-5-cyano-4-(3-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1f).



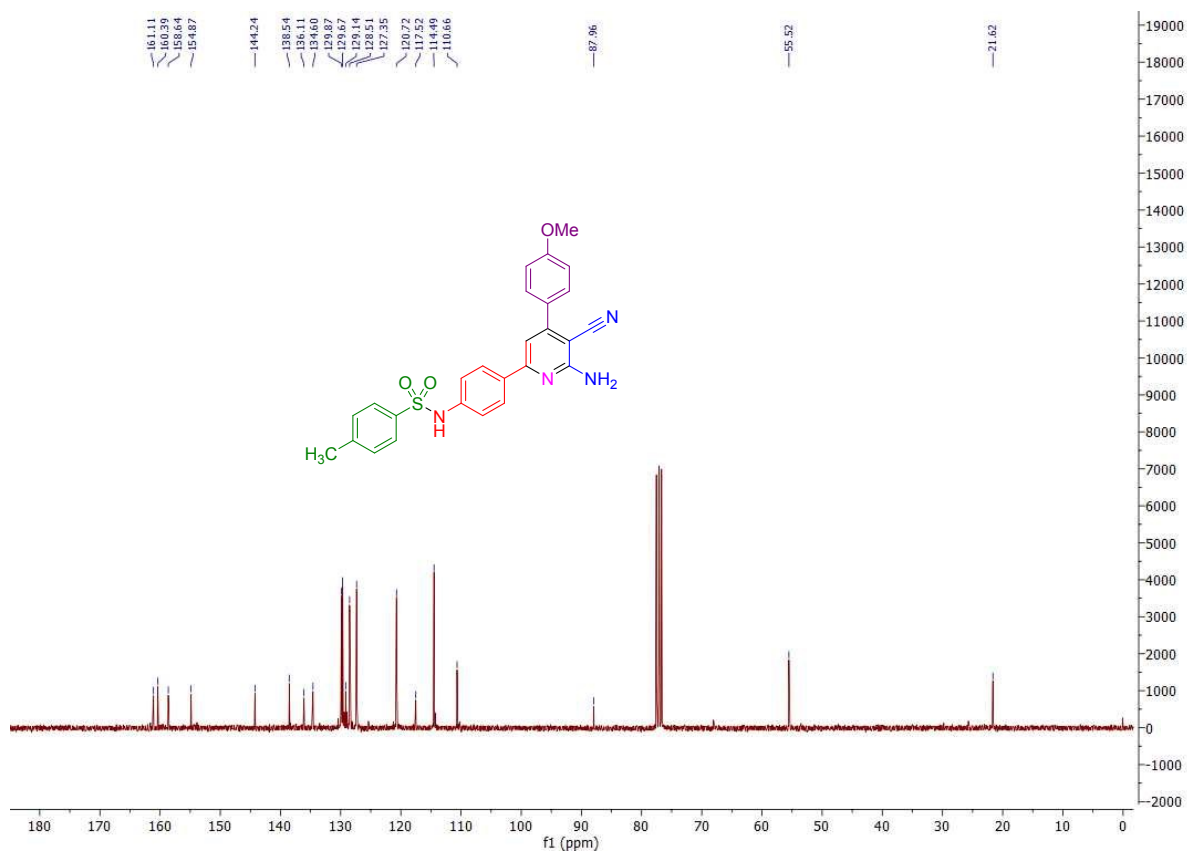
28: FT-IR spectrum of N-(4-(6-amino-5-cyano-4-(4-methoxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1g).



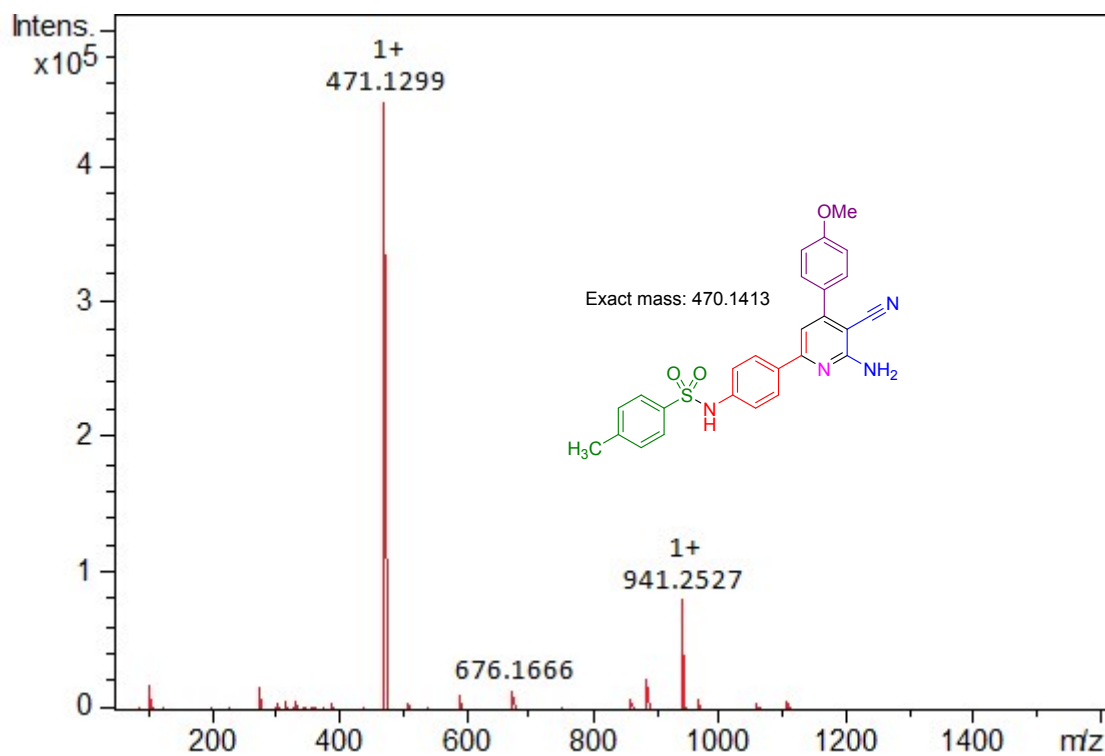
29: ^1H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(4-methoxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1g).



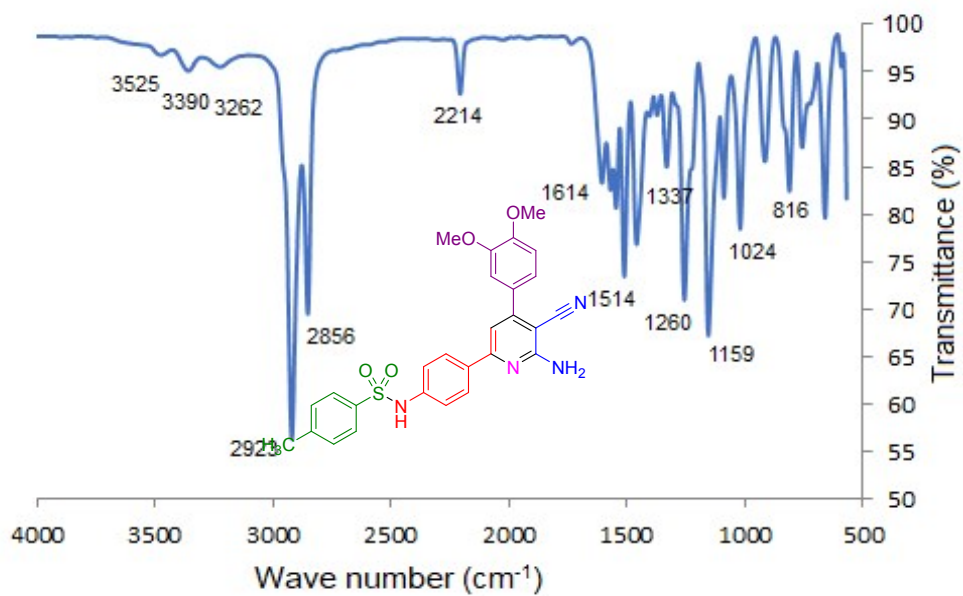
30: ^{13}C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(4-methoxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1g).



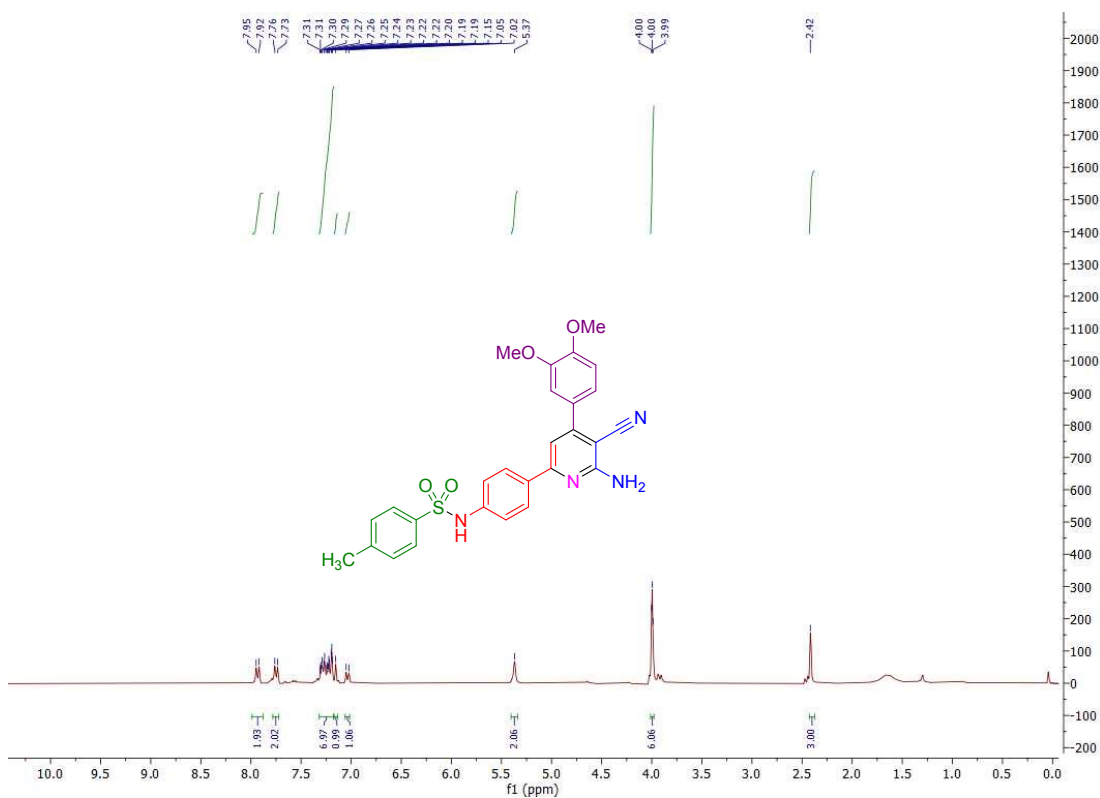
31: HR mass spectrum of *N*-(4-(6-amino-5-cyano-4-(4-methoxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (**1g**).



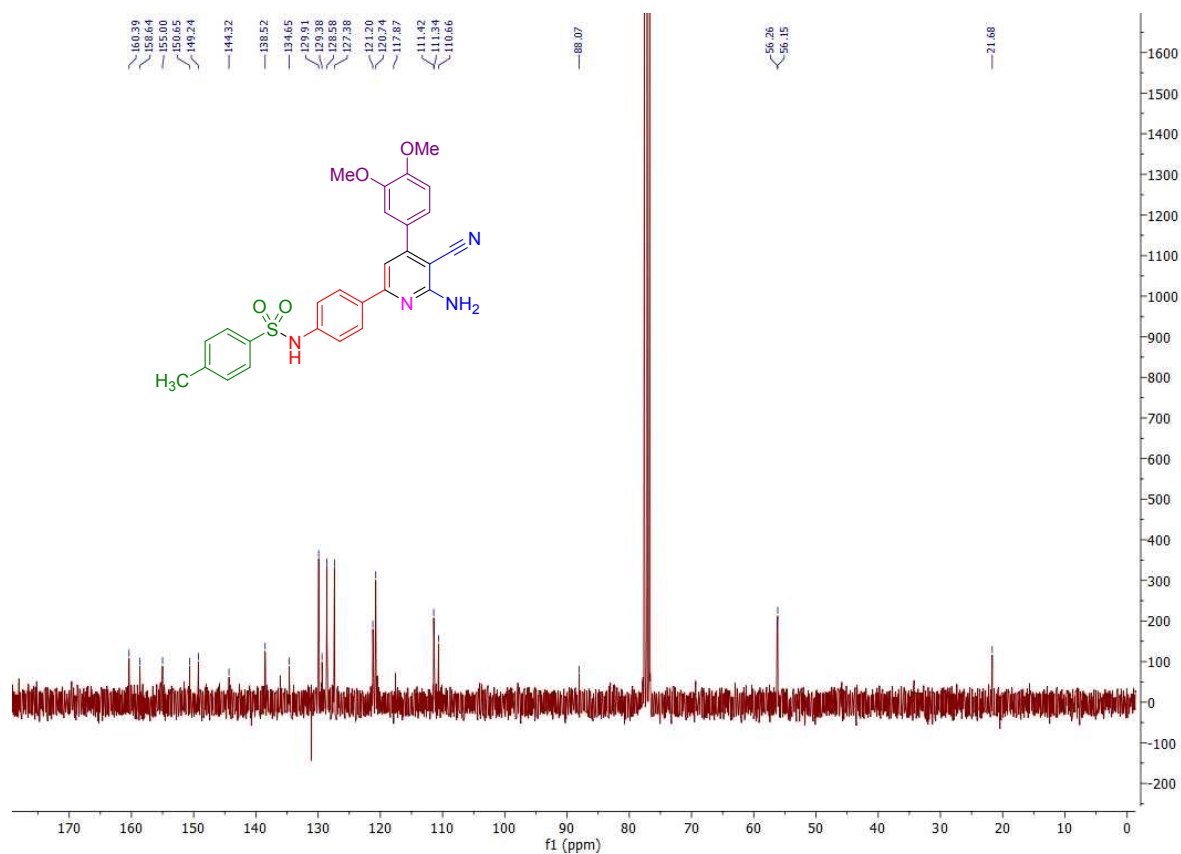
32: FT-IR spectrum of *N*-(4-(6-amino-5-cyano-4-(3,4-dimethoxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (**1h**).



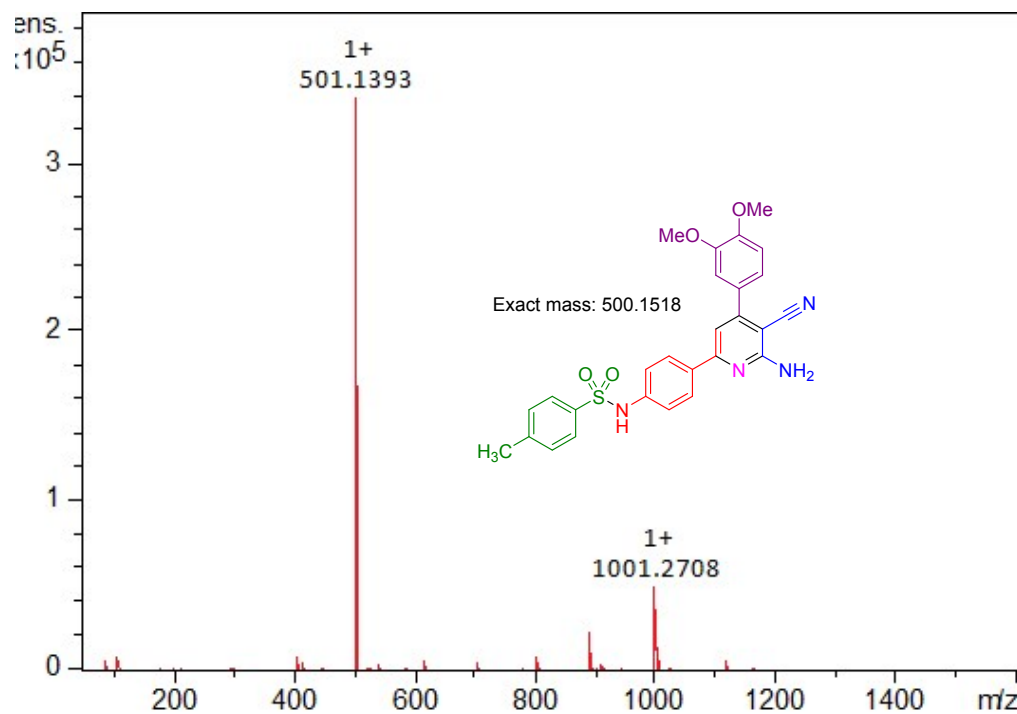
33: ^1H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(3,4-dimethoxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1h).



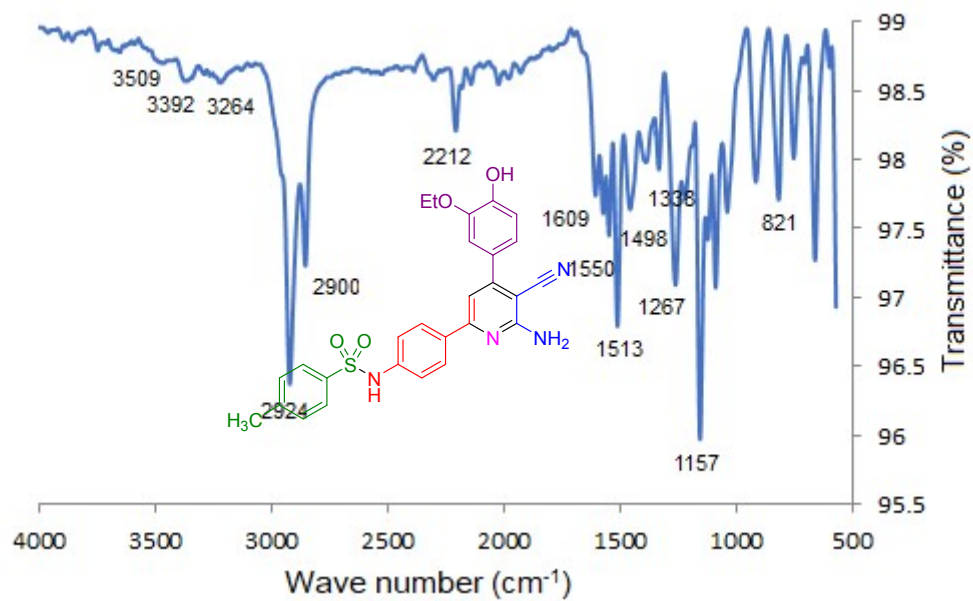
34: ^{13}C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(3,4-dimethoxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1h).



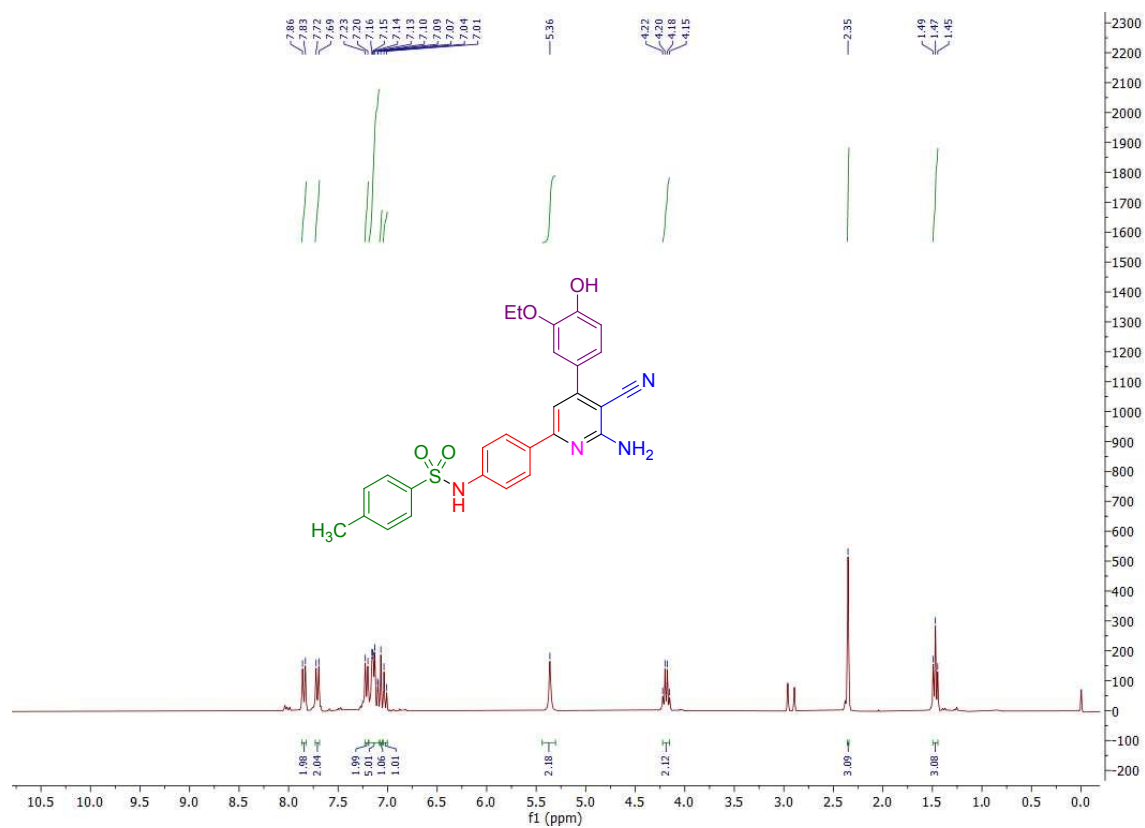
35: HR mass spectrum of *N*-(4-(6-amino-5-cyano-4-(3,4-dimethoxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1h).



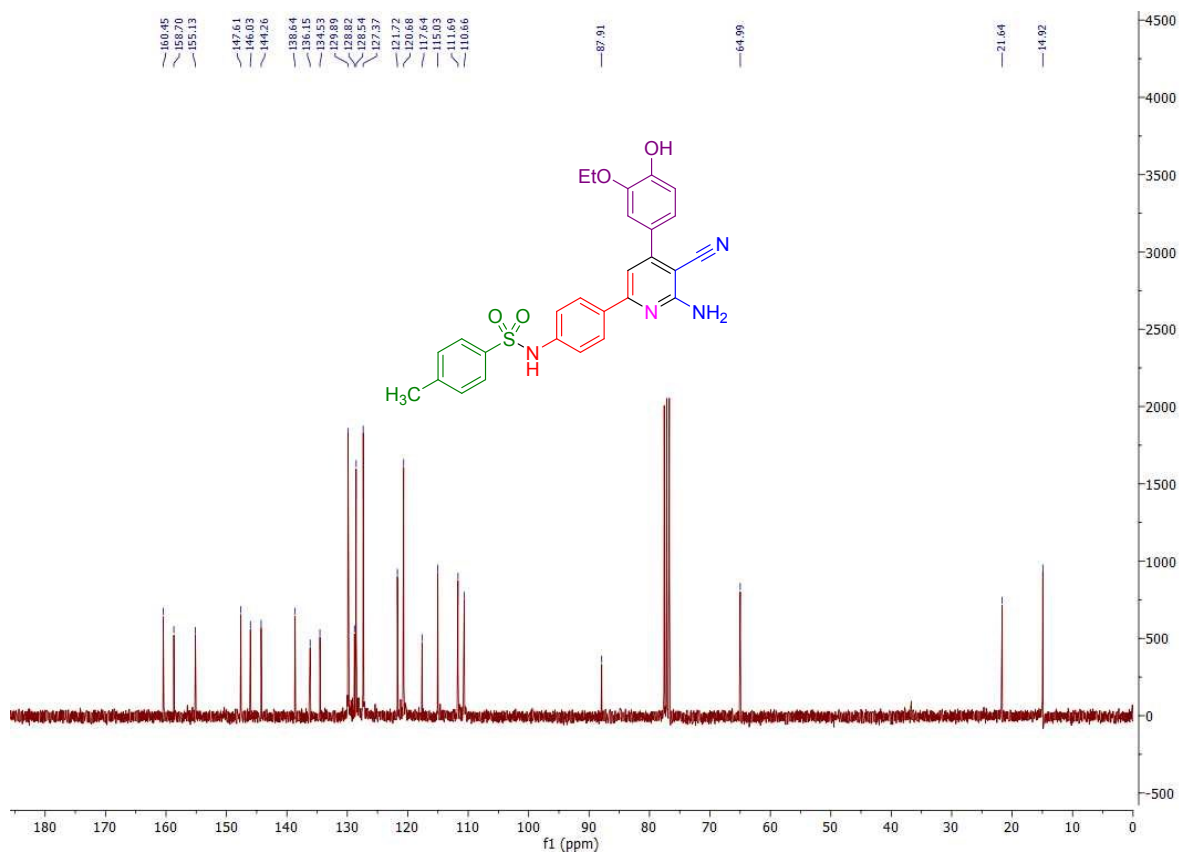
36: FT-IR spectrum of *N*-(4-(6-amino-5-cyano-4-(3-ethoxy-4-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1i).



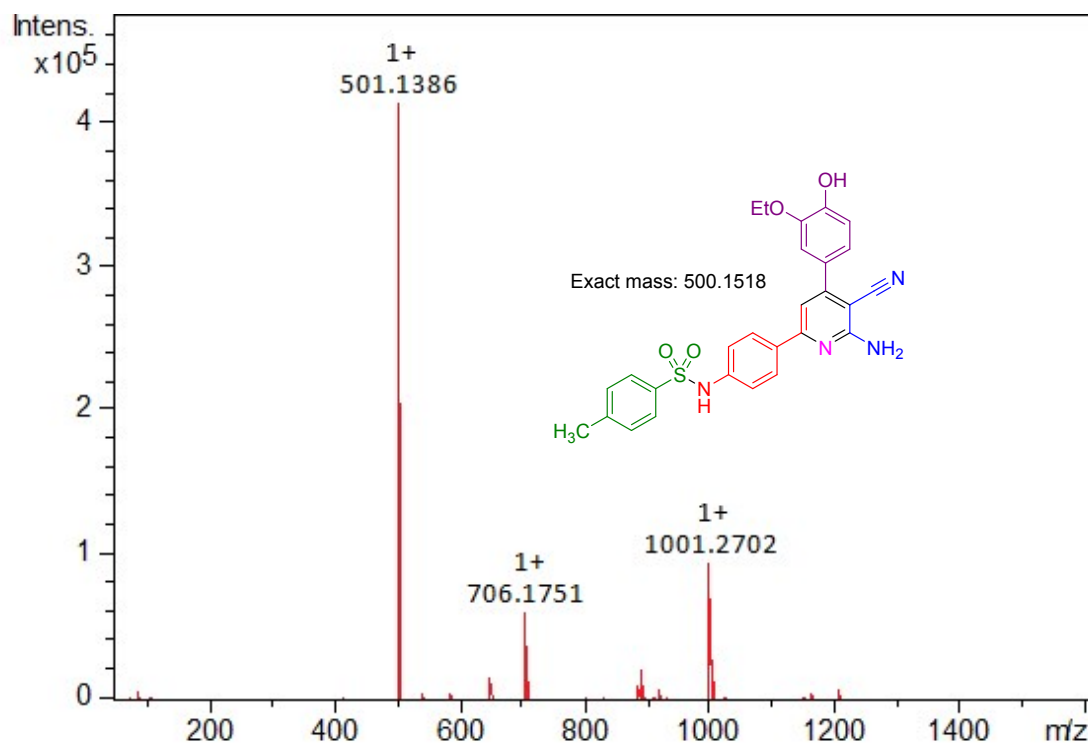
37: ^1H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(3-ethoxy-4-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1i).



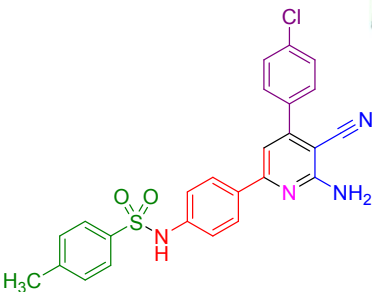
38: ^{13}C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(3-ethoxy-4-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1i).



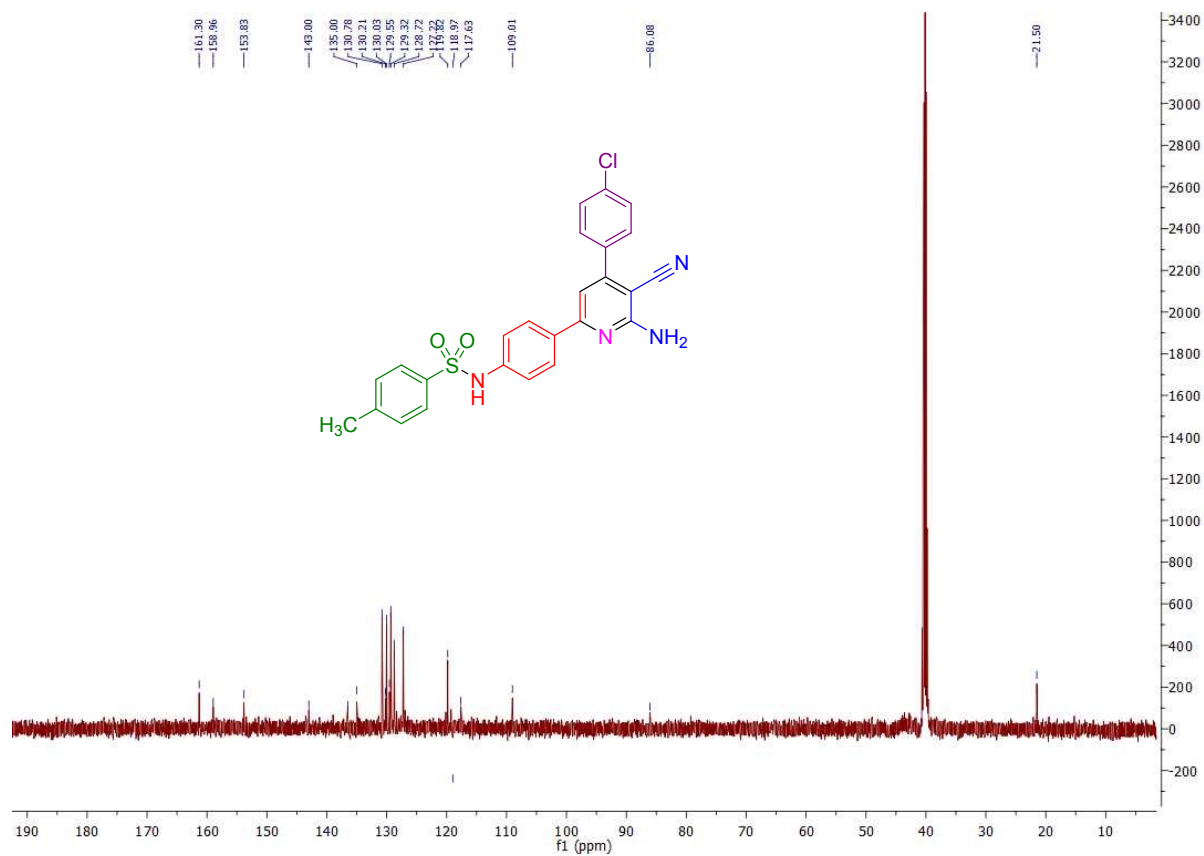
39: HR mass spectrum of *N*-(4-(6-amino-5-cyano-4-(3-ethoxy-4-hydroxyphenyl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1i).



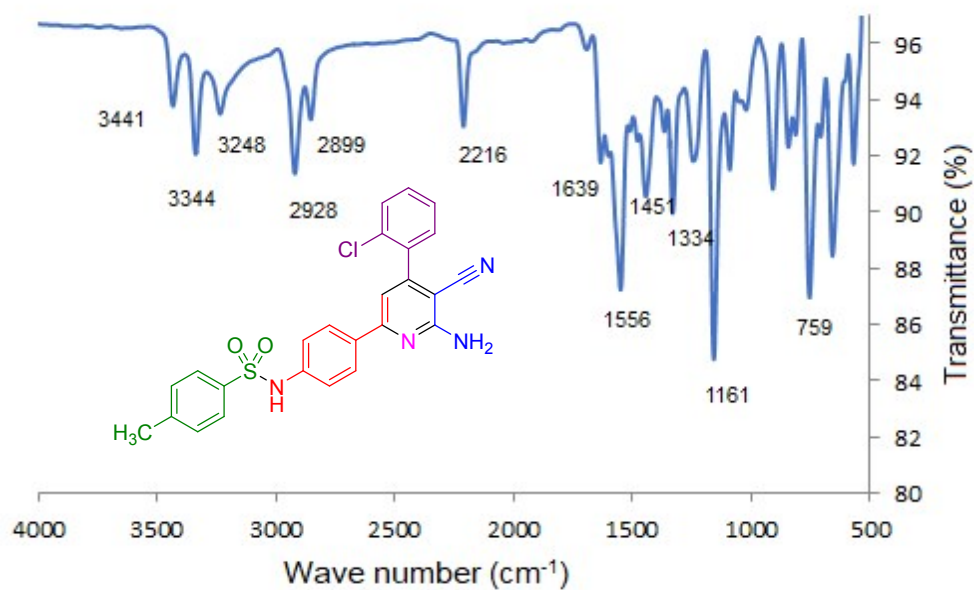
40: ¹H NMR spectrum of *N*-(4-(6-amino-4-(4-chlorophenyl)-5-cyanopyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1j).



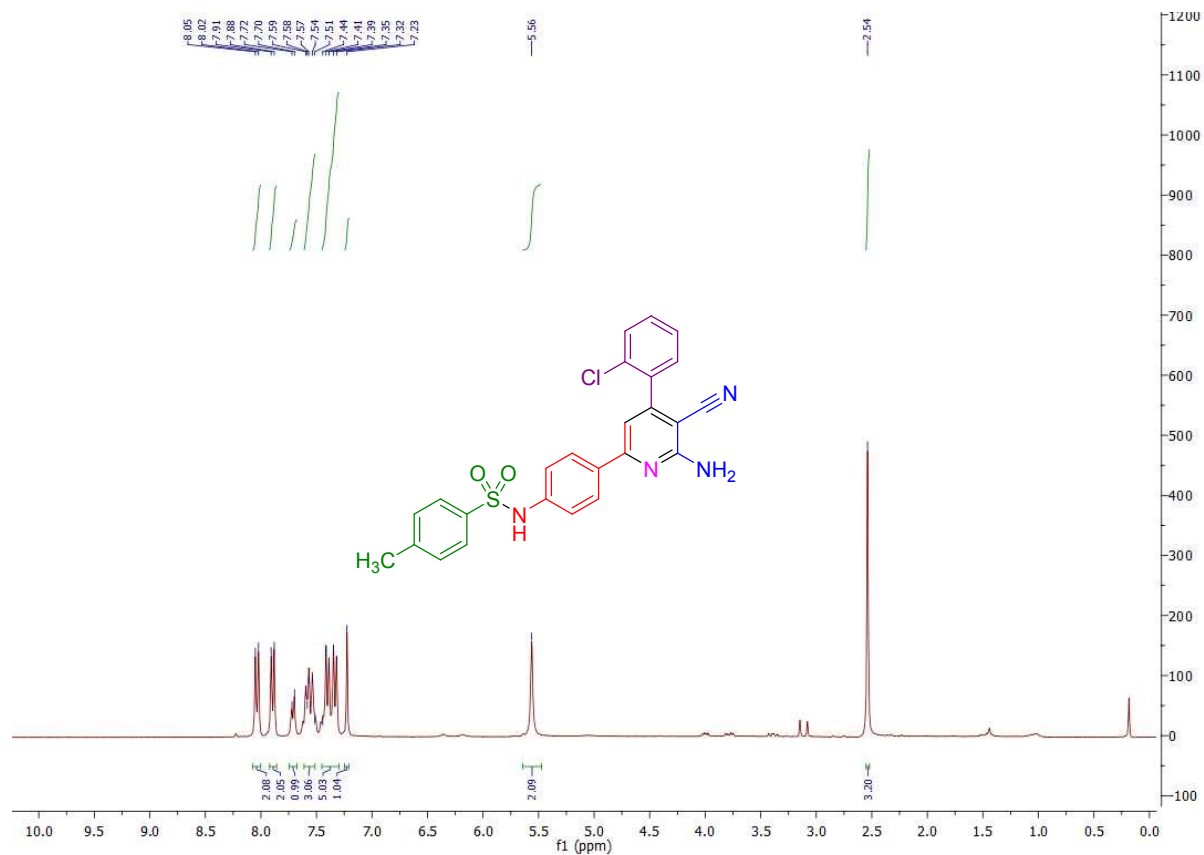
Chemical structure of 4-(4-methylphenyl)sulfonyl-N-(4-chlorophenyl)pyridin-2-amine. The structure is color-coded: the pyridine ring is purple, the N-phenyl ring is red, the sulfonyl group is green, and the 4-methylphenyl ring is green. The methyl group is labeled H₃C. Vibrational wavenumbers (cm⁻¹) are listed for various modes: 3060.00, 3020.00, 3002.00, 300.21, 300.03, 1290.55, 1288.72, 1288.32, 1188.82, 118.97, 117.65, 109.01, and 86.08.



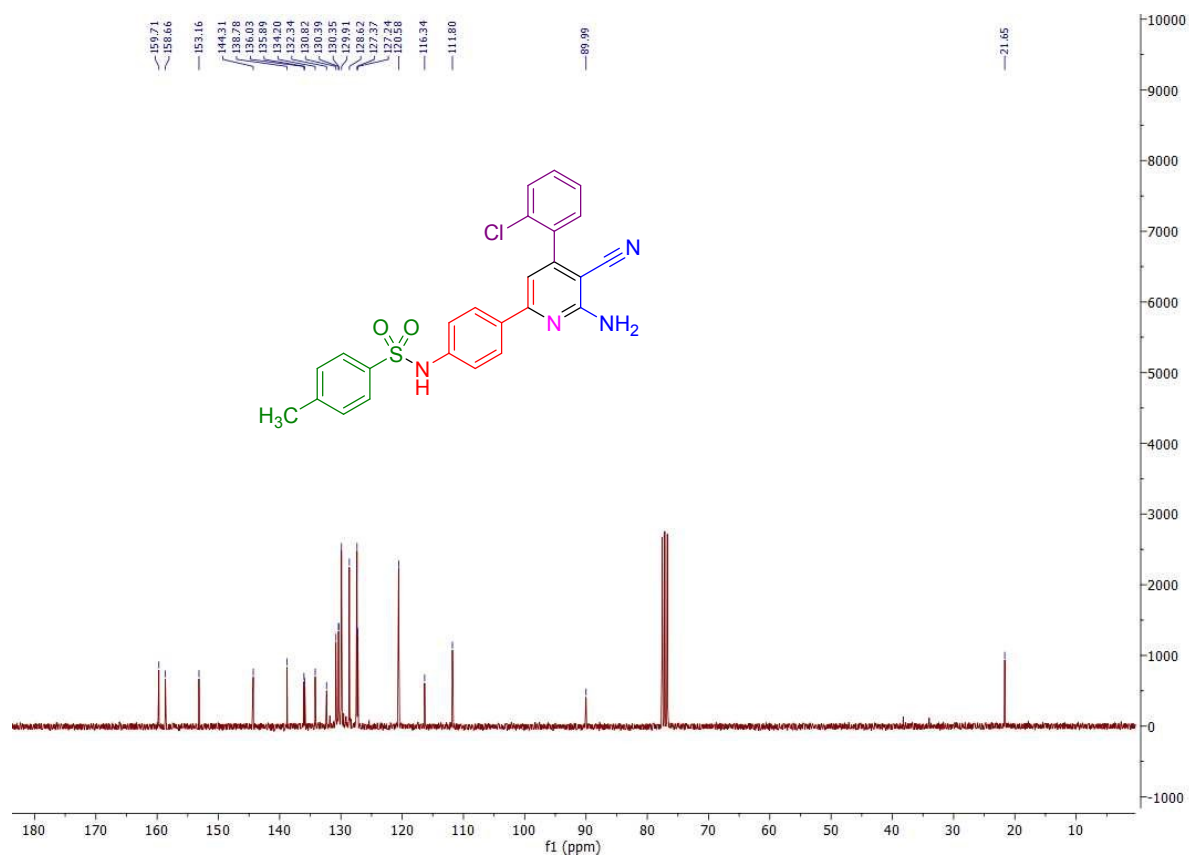
42: FT-IR spectrum of *N*-(4-(6-amino-4-(2-chlorophenyl)-5-cyanopyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1k).



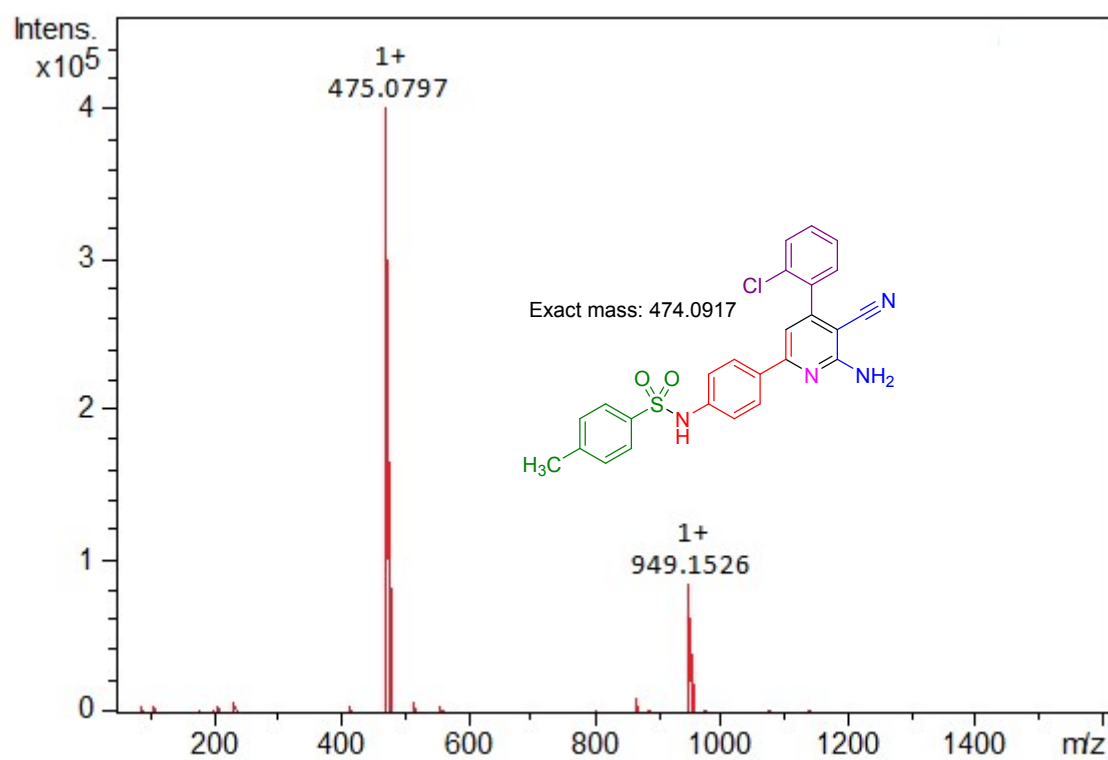
43: ^1H NMR spectrum of *N*-(4-(6-amino-4-(2-chlorophenyl)-5-cyanopyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1k).



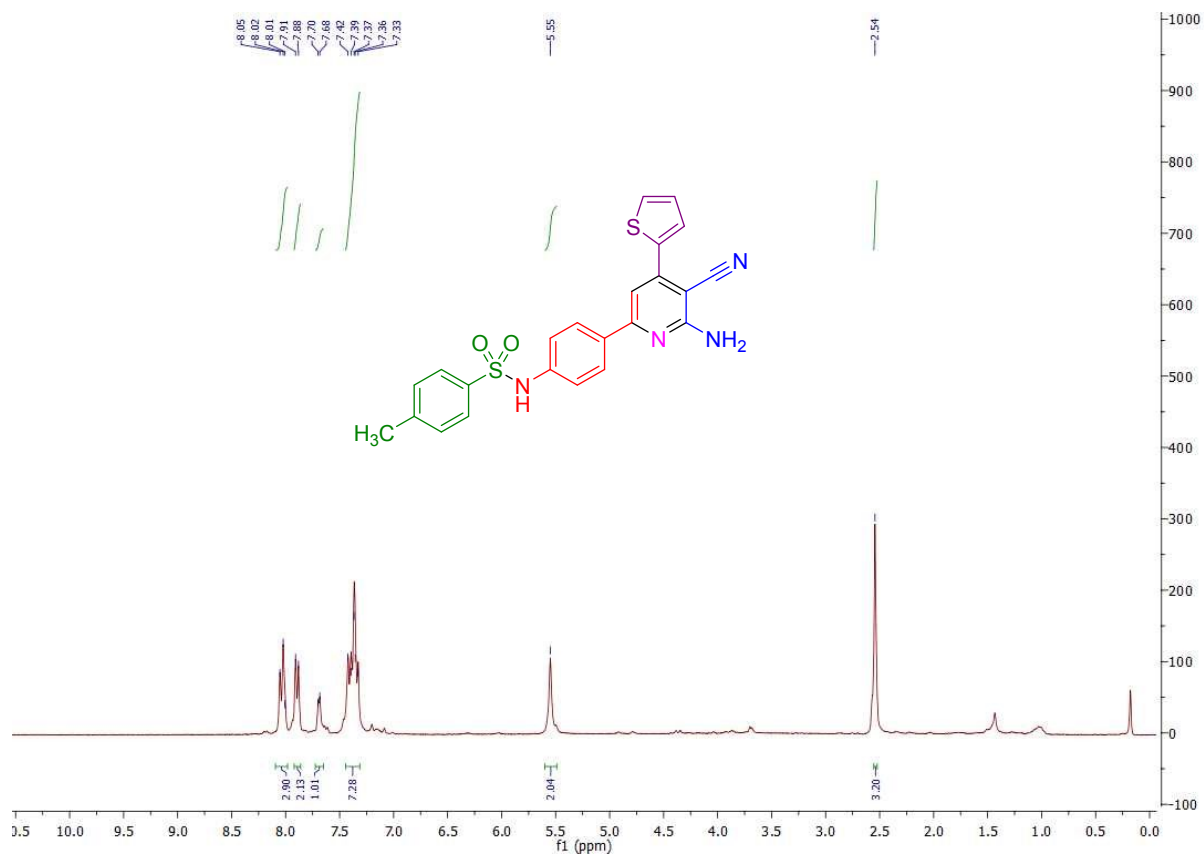
44: ^{13}C NMR spectrum of *N*-(4-(6-amino-4-(2-chlorophenyl)-5-cyanopyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1k).



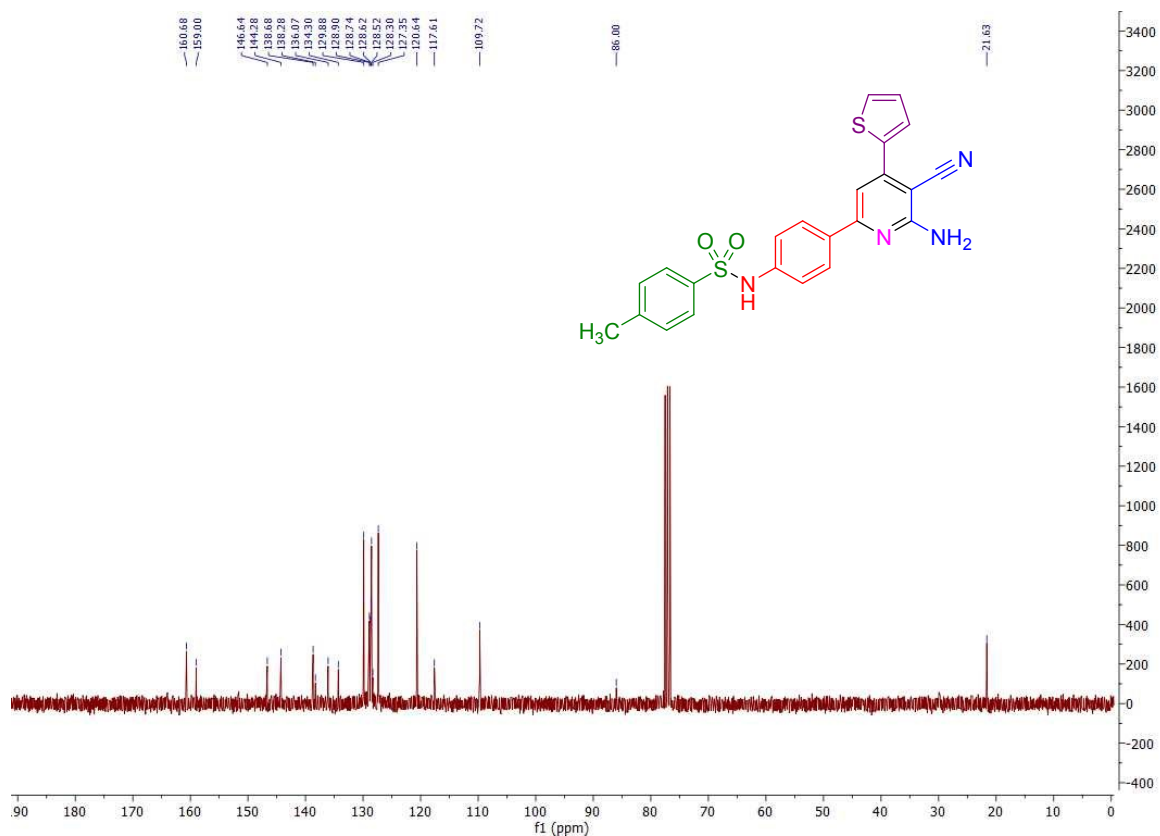
45: HR mass spectrum of *N*-(4-(6-amino-4-(2-chlorophenyl)-5-cyanopyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (1k).



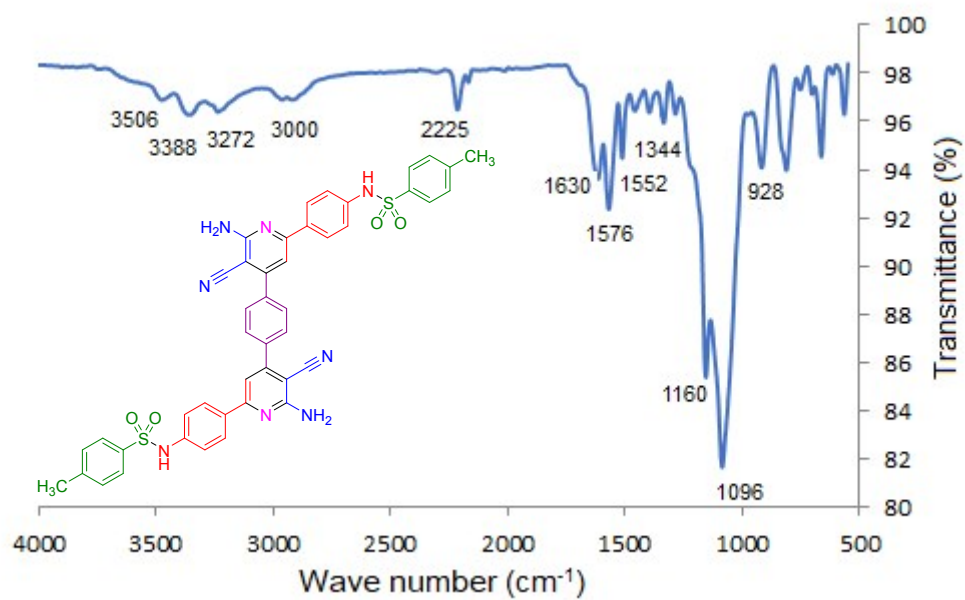
46: ^1H NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(thiophen-2-yl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (11).



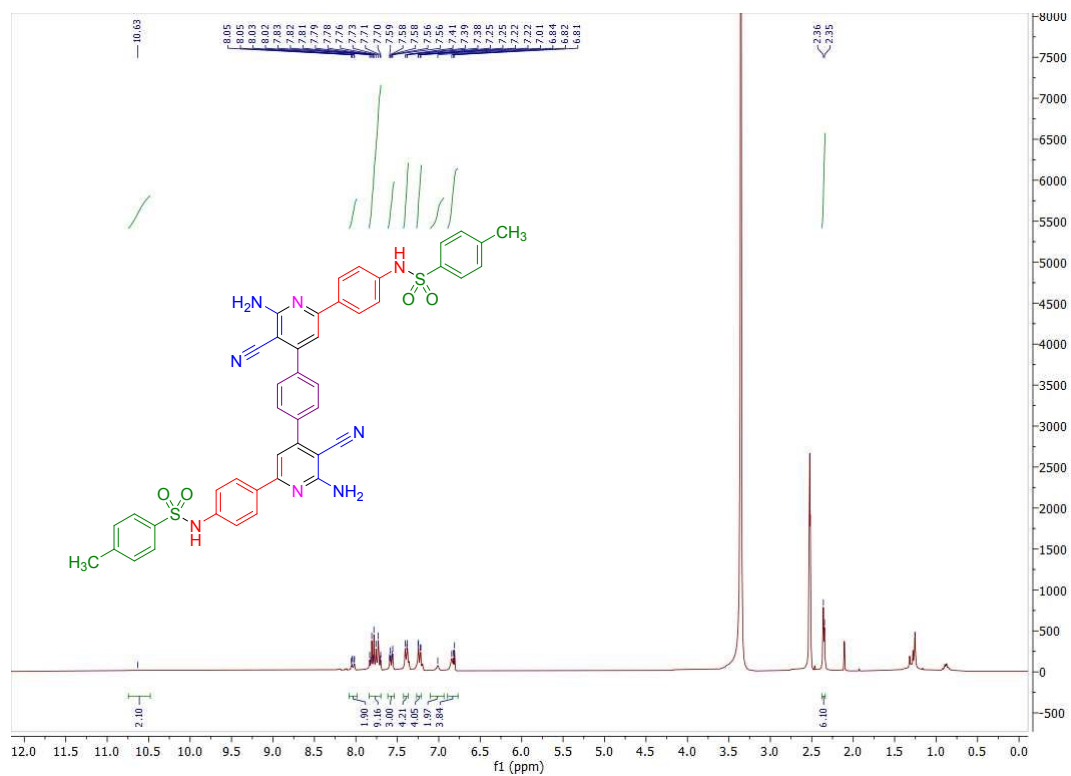
47: ^{13}C NMR spectrum of *N*-(4-(6-amino-5-cyano-4-(thiophen-2-yl)pyridin-2-yl)phenyl)-4-methylbenzenesulfonamide (11).



48: FT-IR spectrum of *N,N'*-((1,4-phenylenebis(6-amino-5-cyanopyridine-4,2-diyl))bis(4,1-phenylene))bis(4-methylbenzenesulfonamide) (1m).



49: ¹H NMR spectrum of *N,N'*-((1,4-phenylenebis(6-amino-5-cyanopyridine-4,2-diyl))bis(4,1-phenylene))bis(4-methylbenzenesulfonamide) (1m).



50: HR mass spectrum of *N,N'*-((1,4-phenylenebis(6-amino-5-cyanopyridine-4,2-diyl))bis(4,1-phenylene))bis(4-methylbenzenesulfonamide) (1m).

