A Microwave Assisted Tandem Synthesis of Quinazolinones using Ionic Liquid Supported Copper (II) Catalyst with Mechanistic Insights

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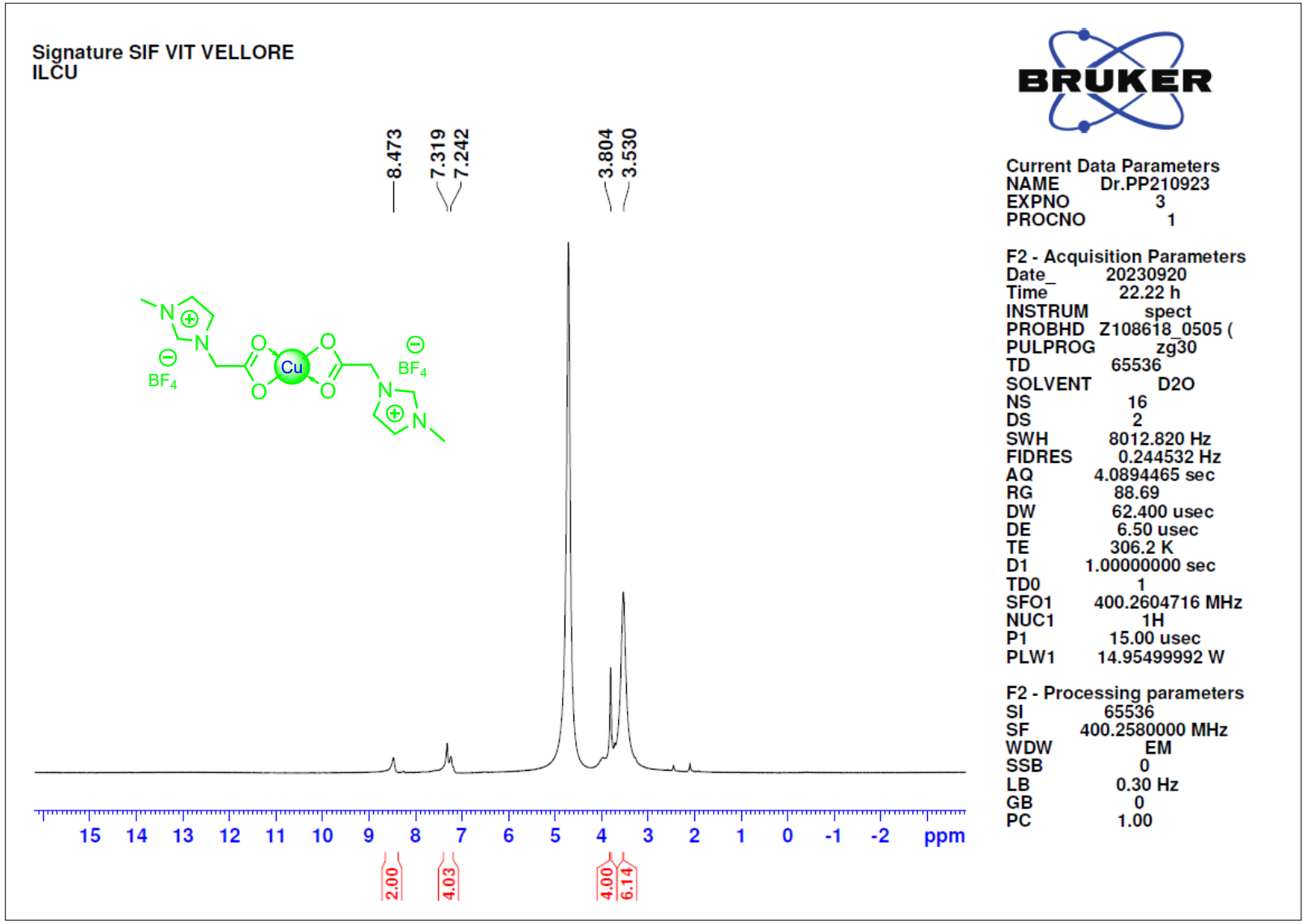

Figure 1: ^{1}H NMR spectrum of the ionic liquid supported copper catalyst **4**.

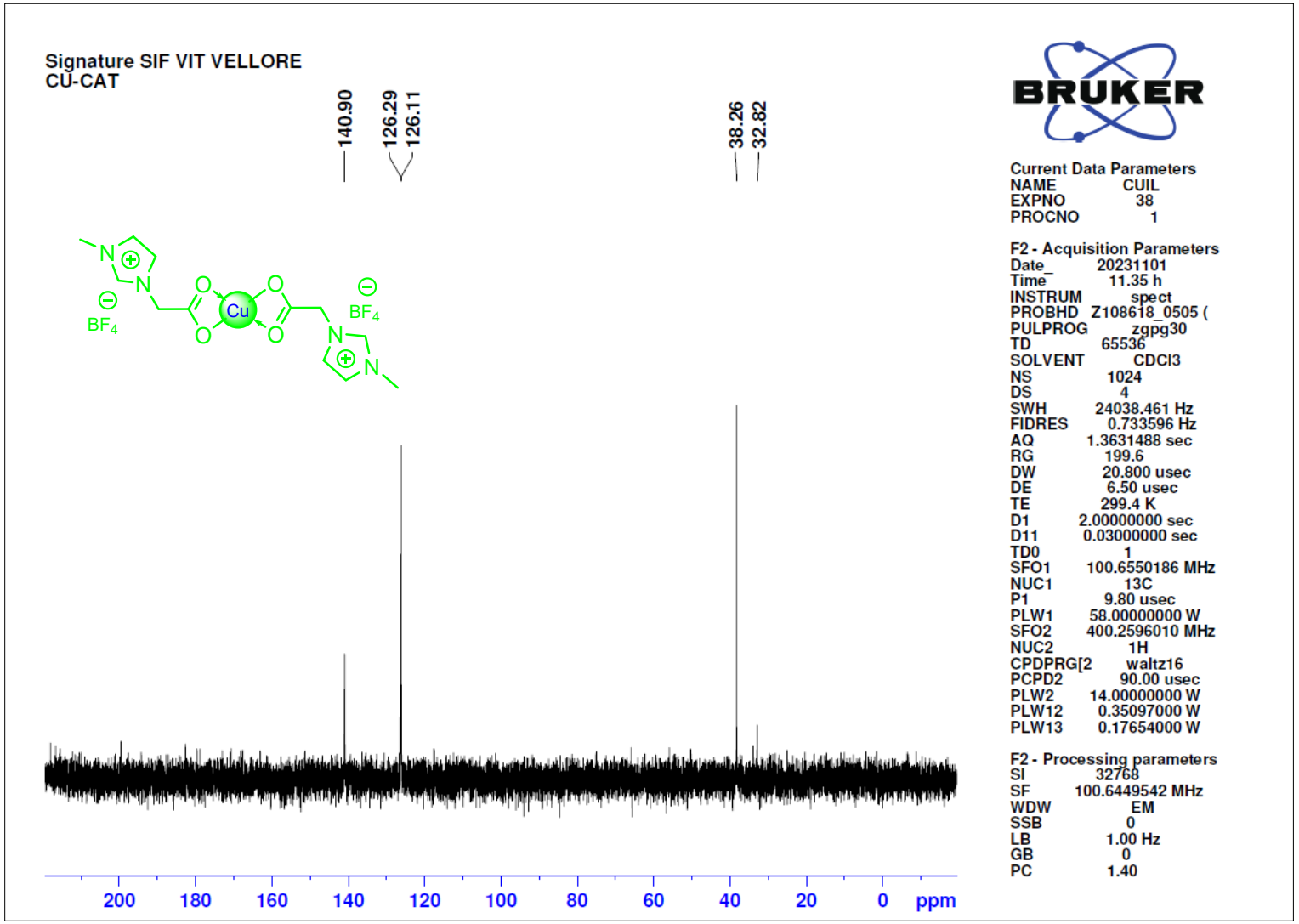

Figure 2: ^{13}C NMR spectrum of the ionic liquid supported copper catalyst **4**.

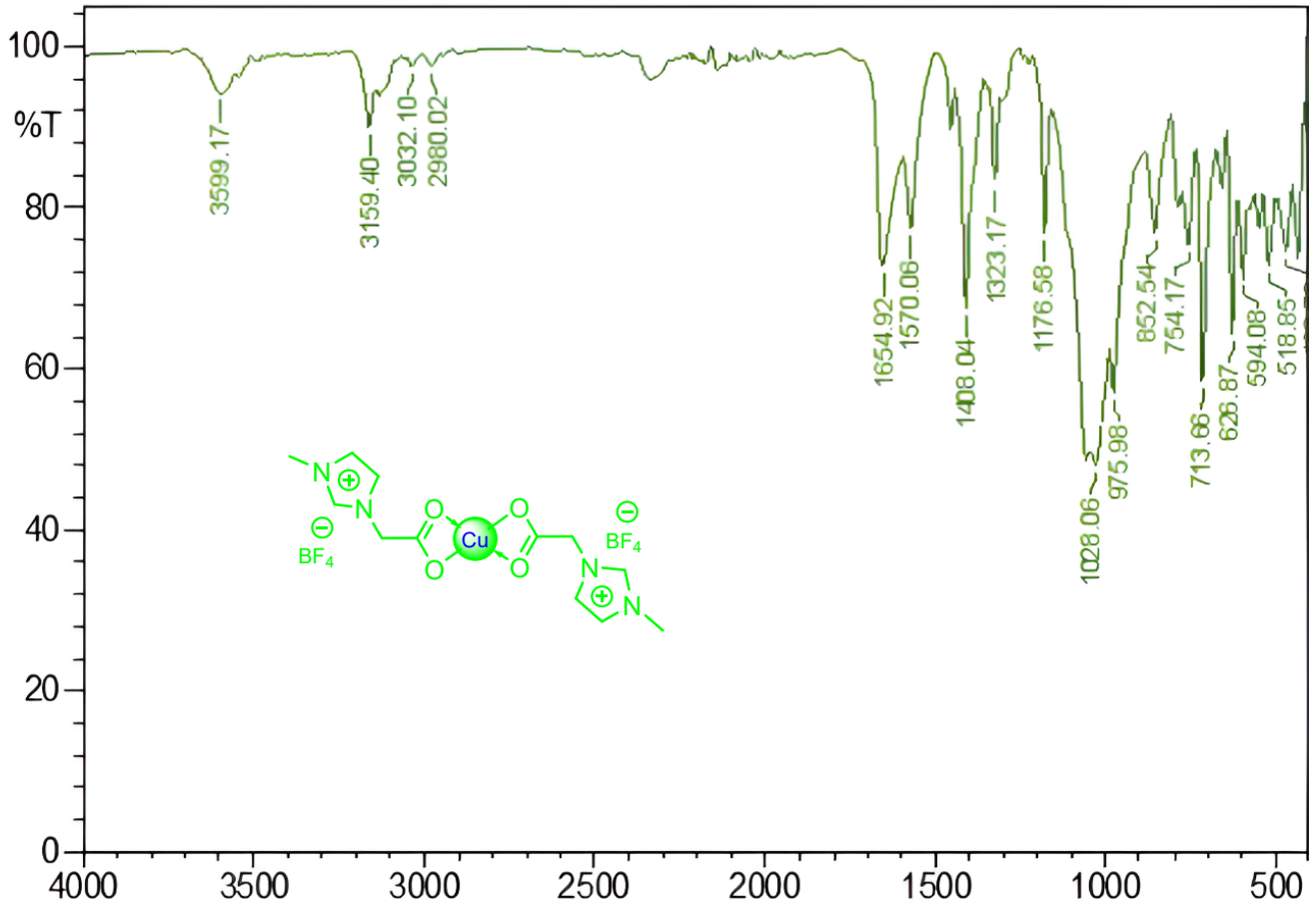

Figure 3: FT-IR spectrum of the ionic liquid supported copper catalyst **4**.

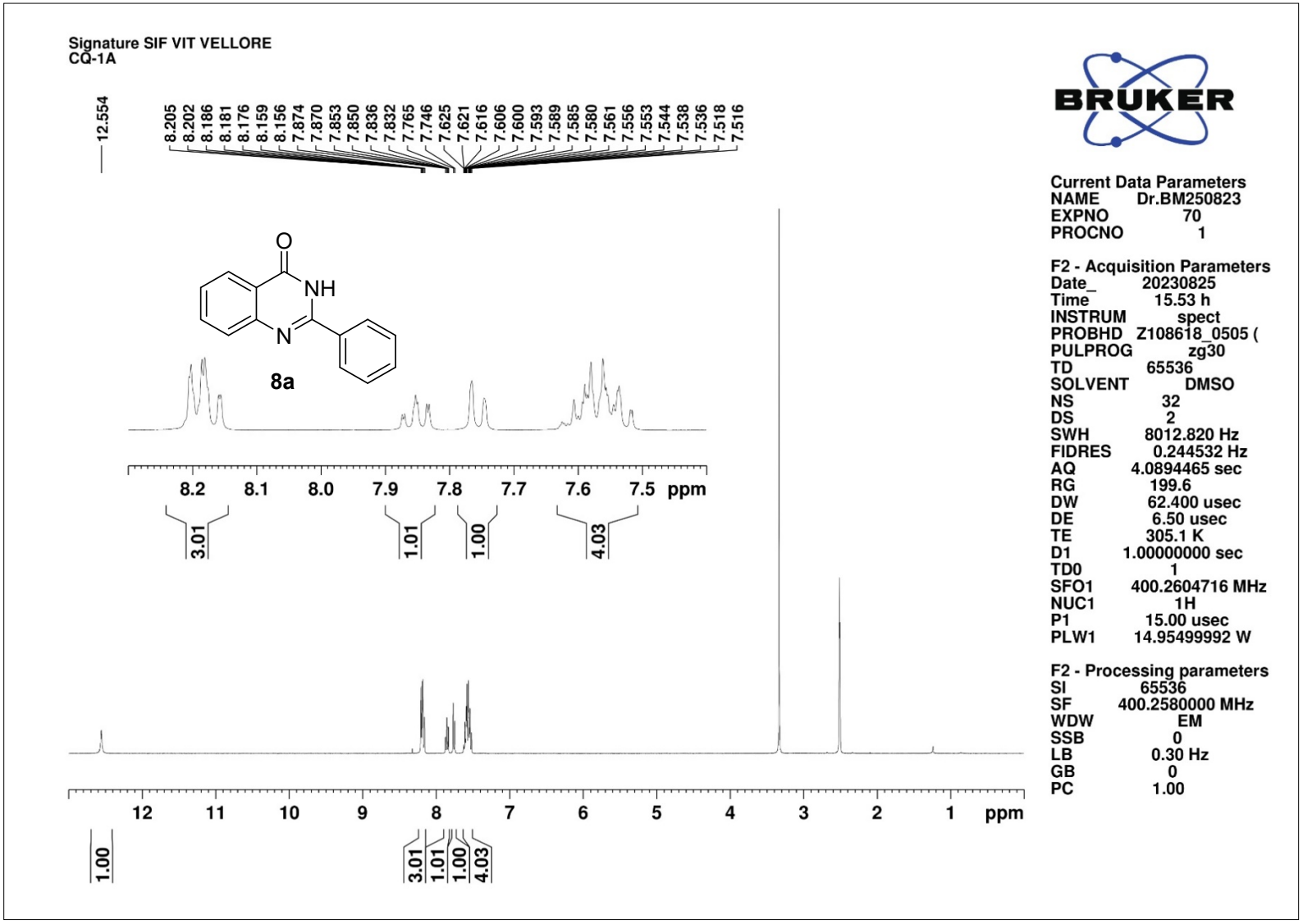

Figure 4: [1]H NMR spectrum of the compound **8a**.

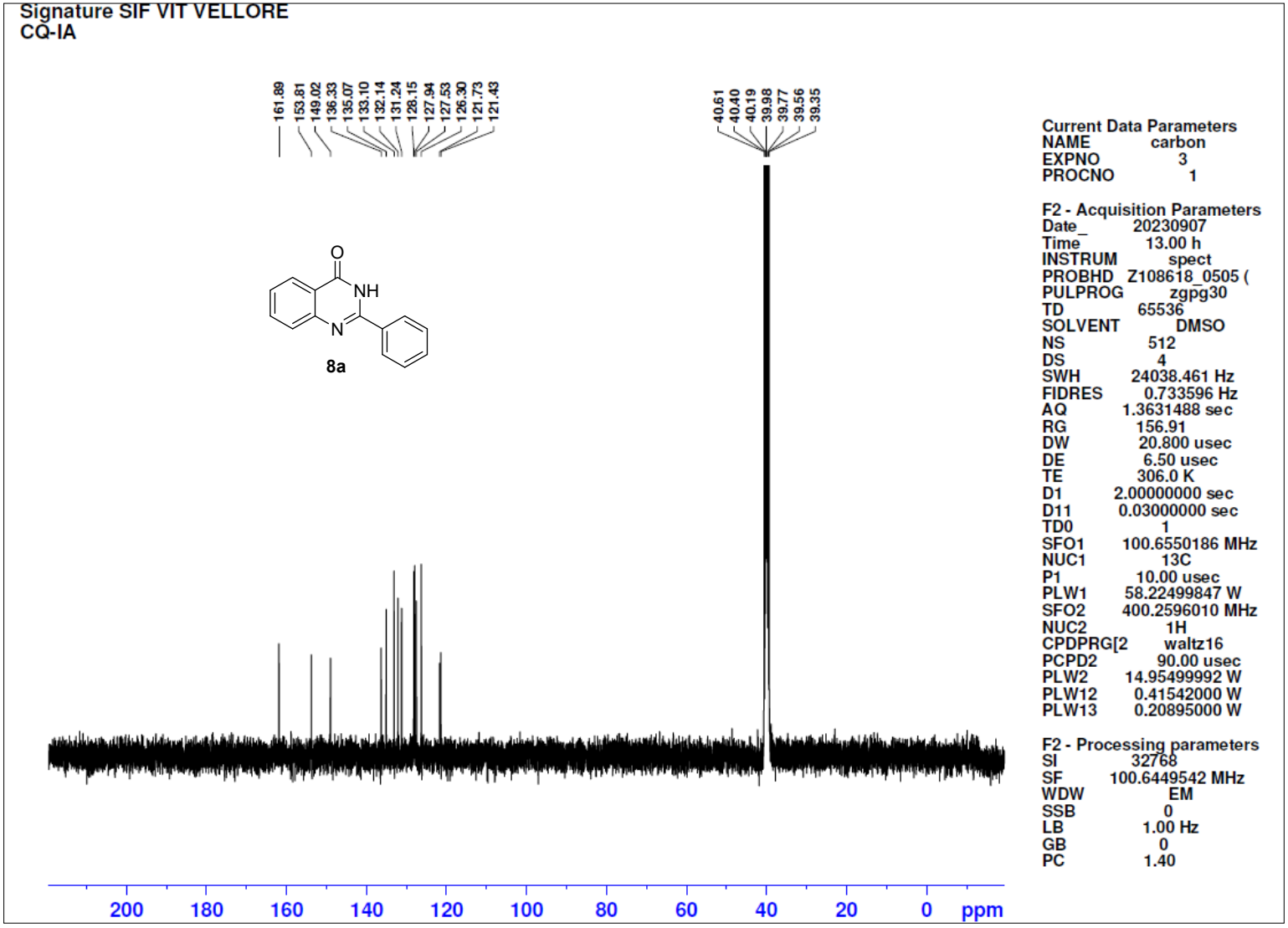

Figure 5: ^{13}C NMR spectrum of the compound **8a**.

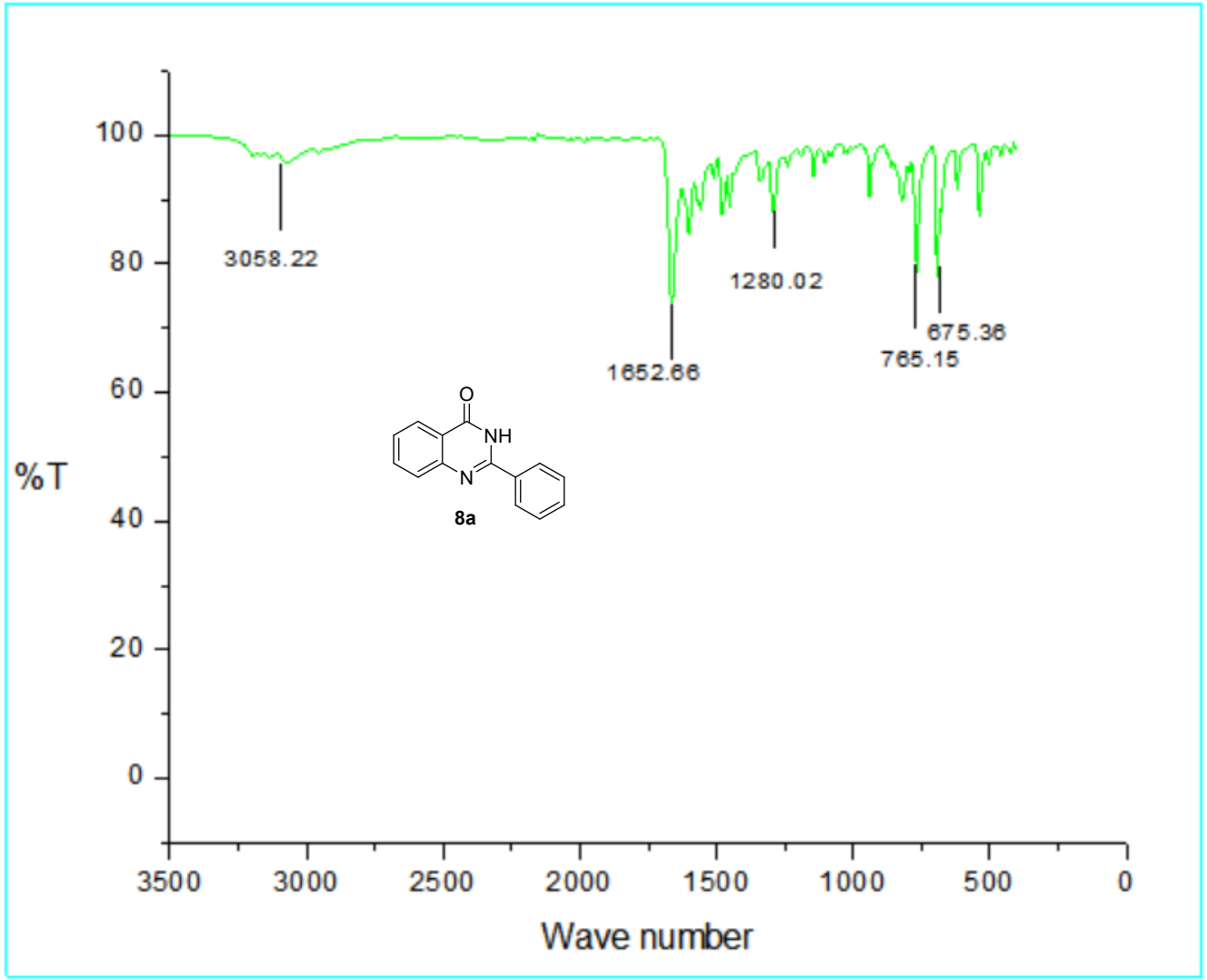

Figure 6: FT-IR spectrum of the compound **8a**.

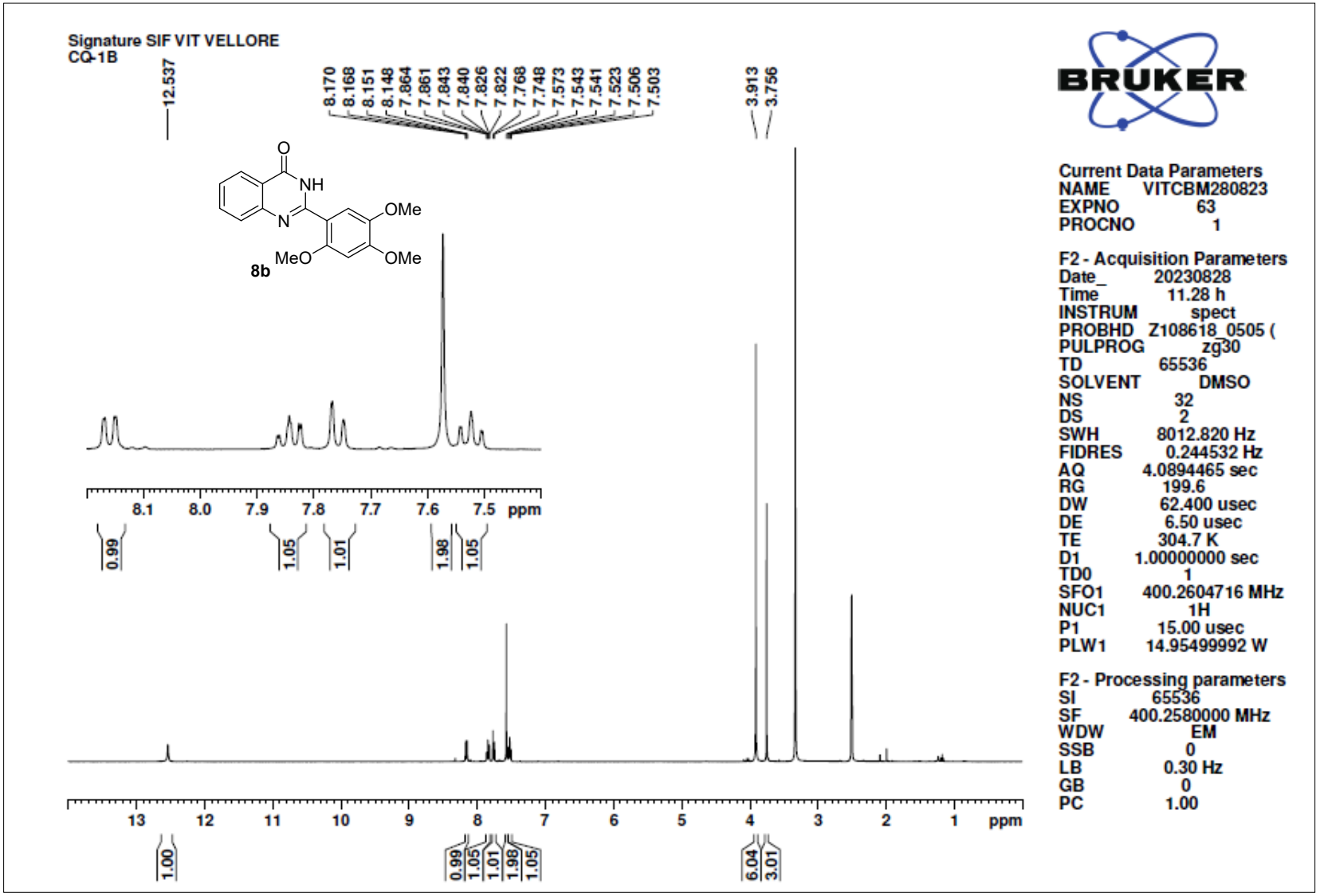

Figure 7: ^{1}H NMR spectrum of the compound **8b**.

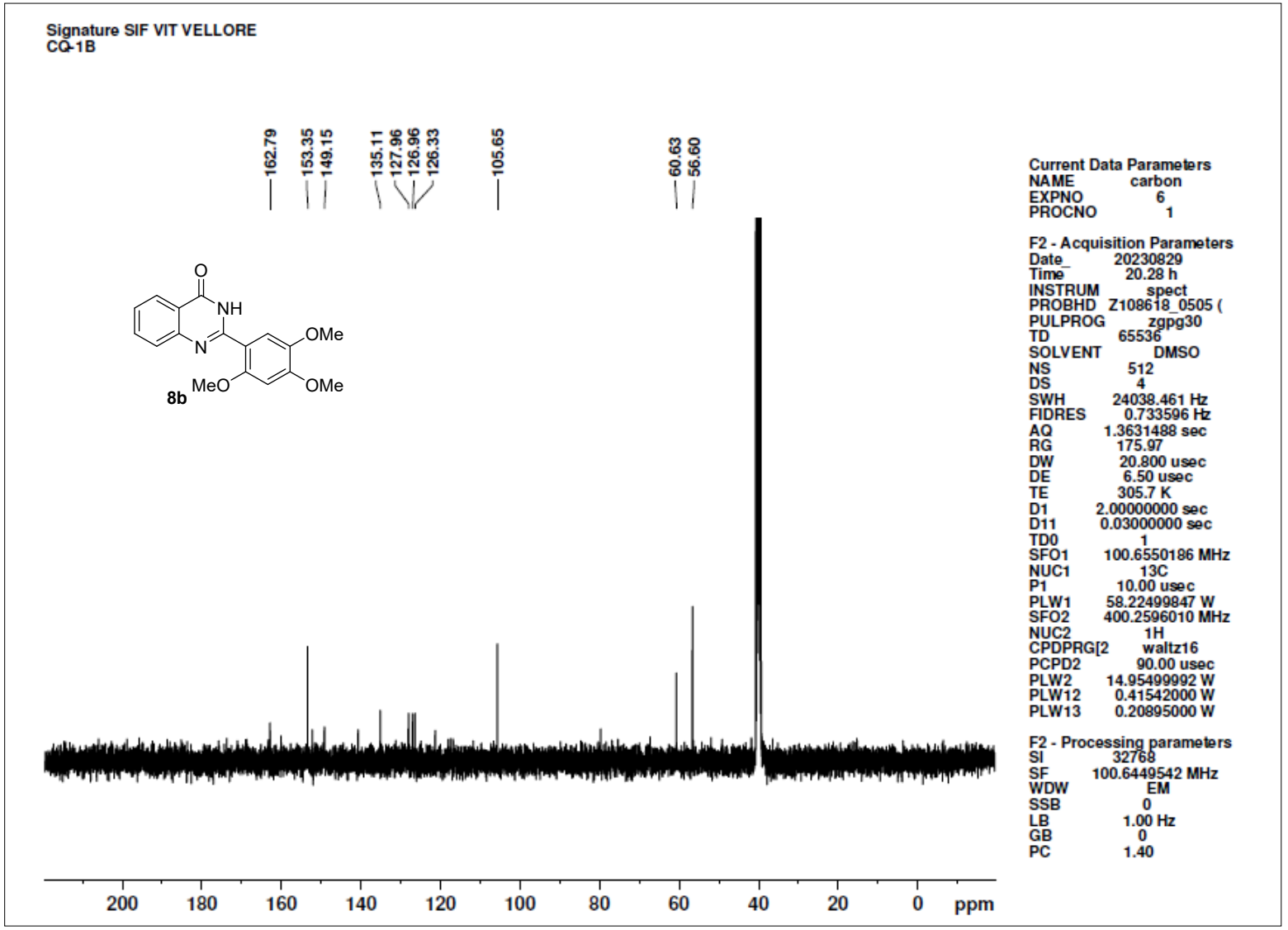

Figure 8: ^{13}C NMR spectrum of the compound **8b**.

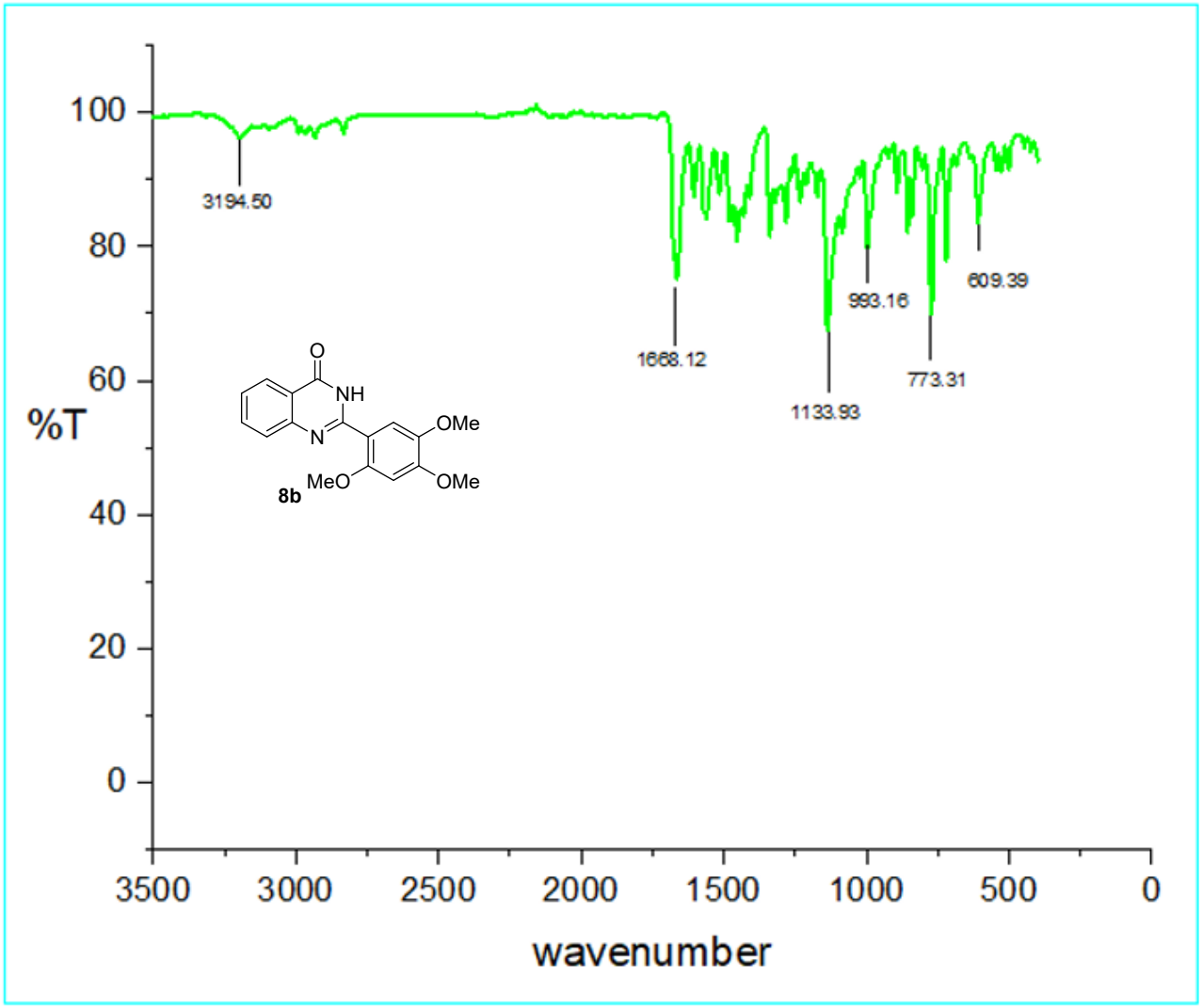

Figure 9: FT-IR spectrum of the compound **8b**.

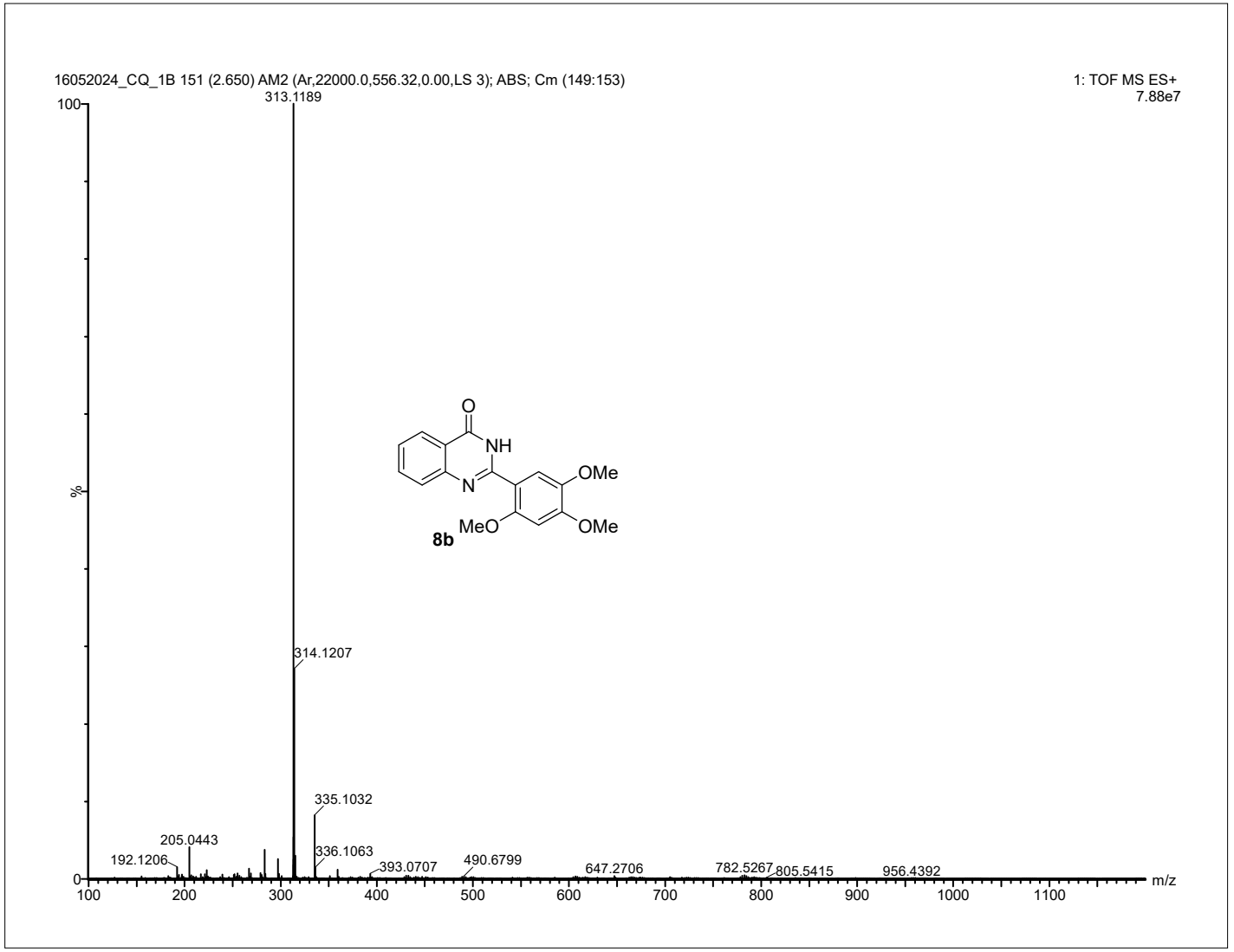

Figure 10: HRMS spectrum of the compound **8b**.

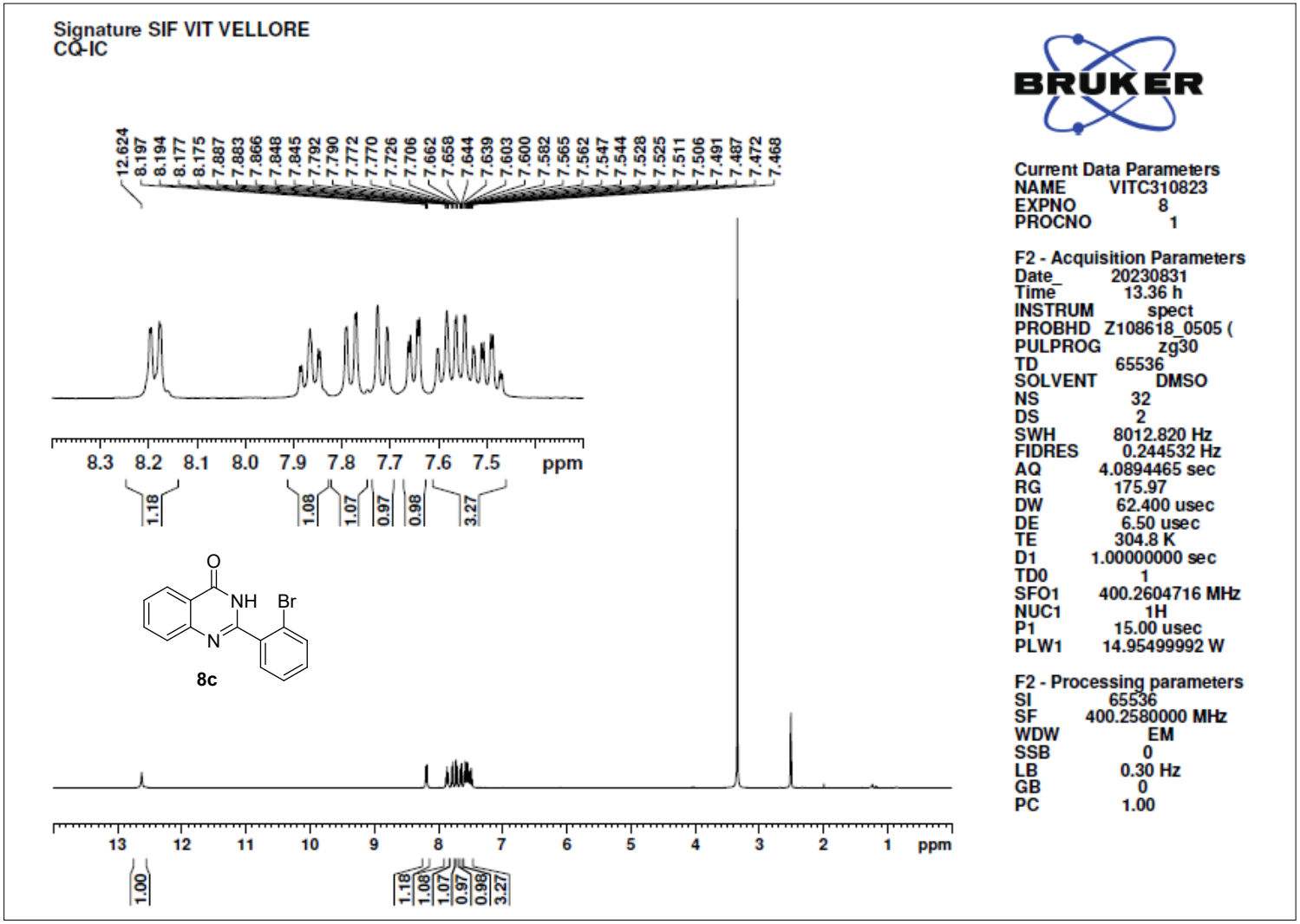

Figure 11: ^{1}H NMR spectrum of the compound **8c**.

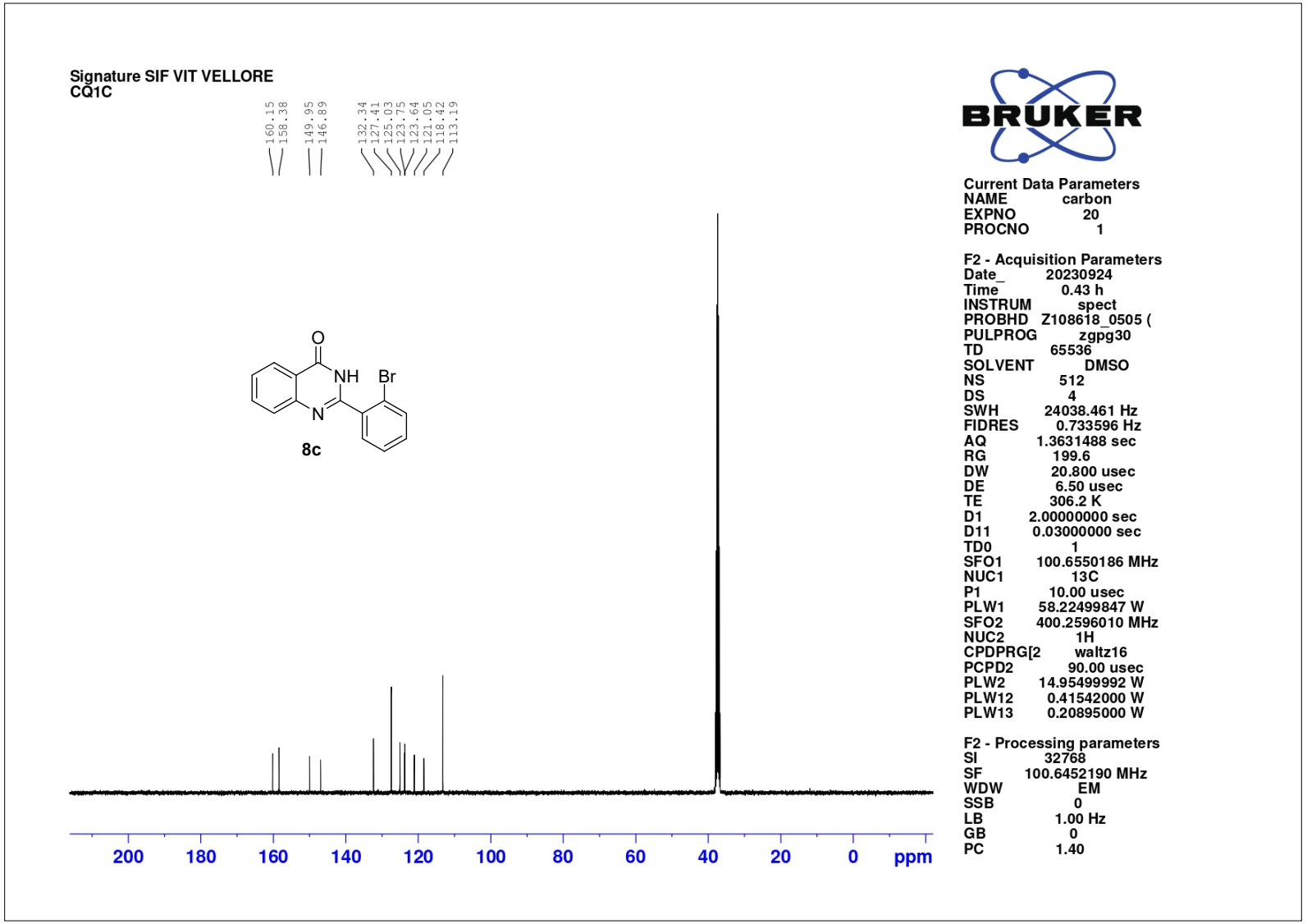

Figure 12: ^{13}C NMR spectrum of the compound **8c**.

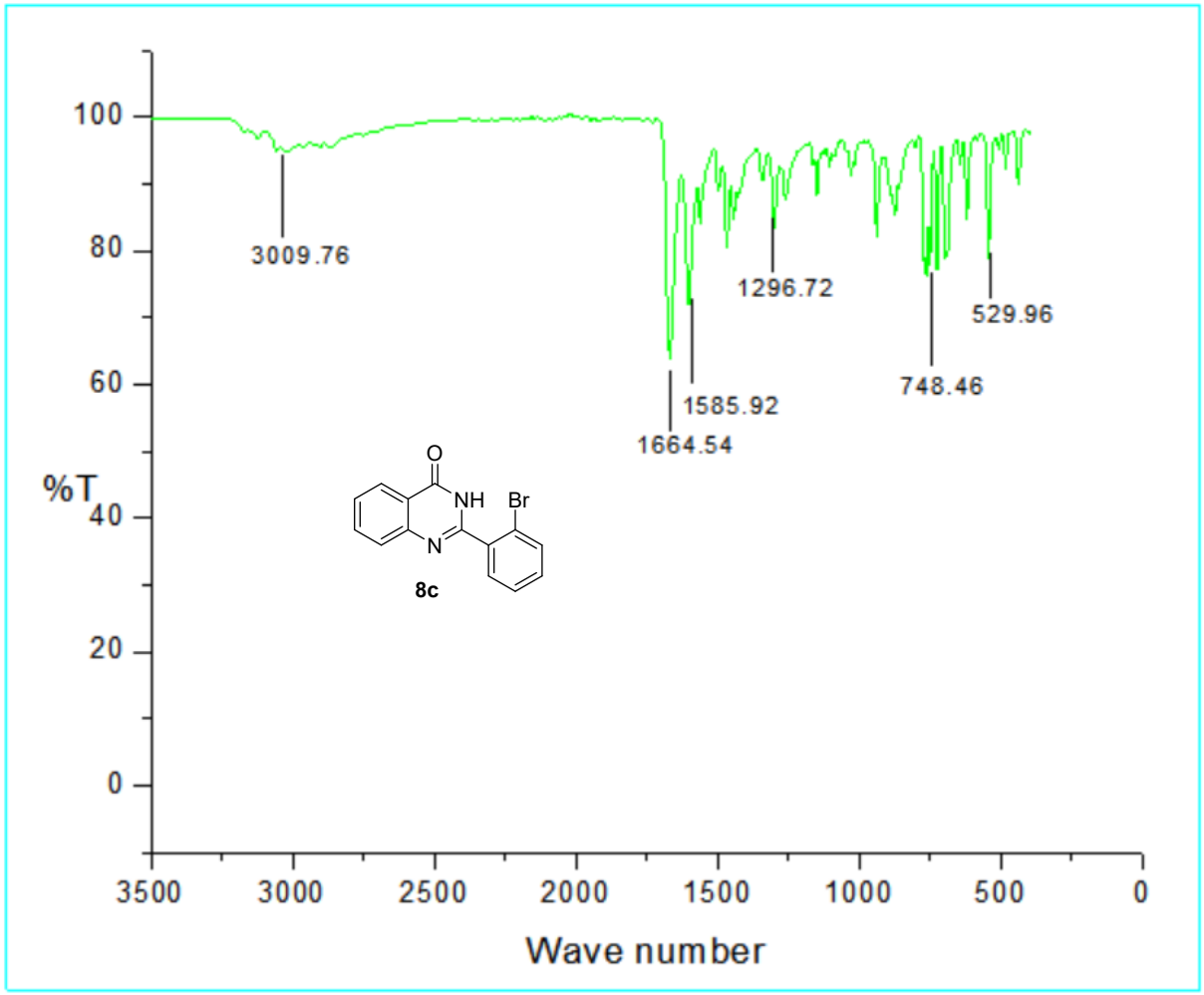

Figure 13: FT-IR spectrum of the compound **8c**.

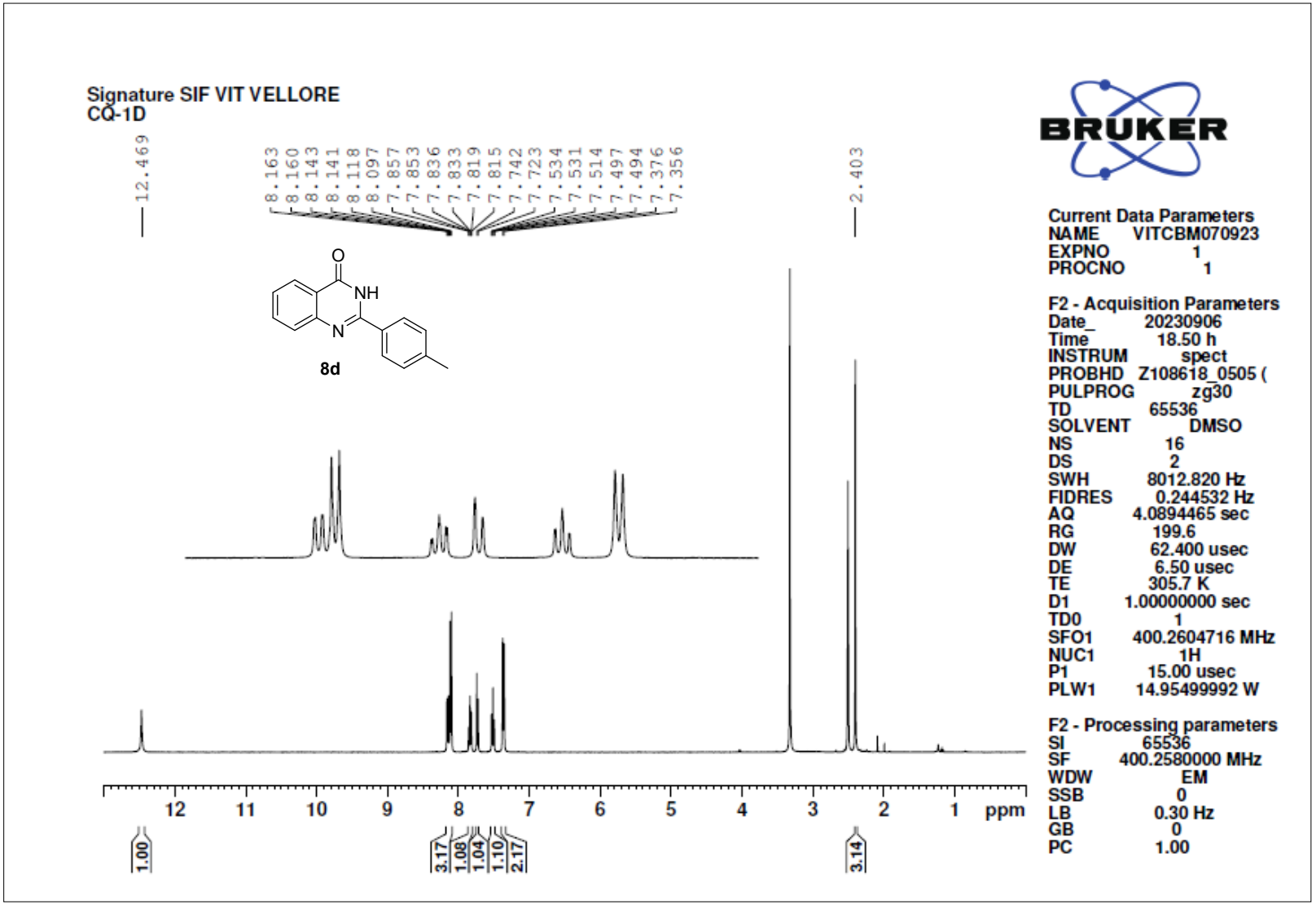

Figure 14: ^{1}H NMR spectrum of the compound **8d**.

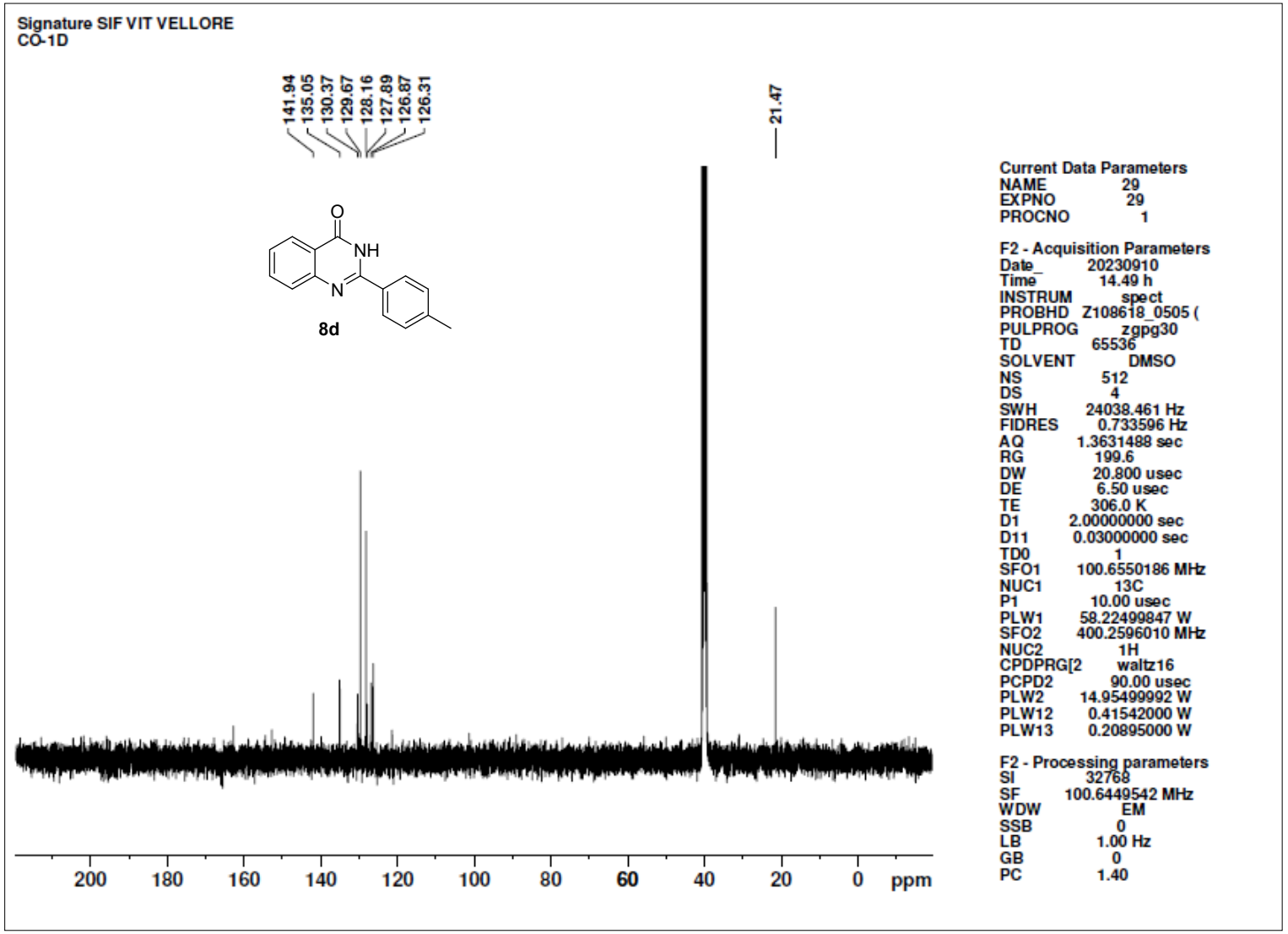

Figure 15: ^{13}C NMR spectrum of the compound **8d**.

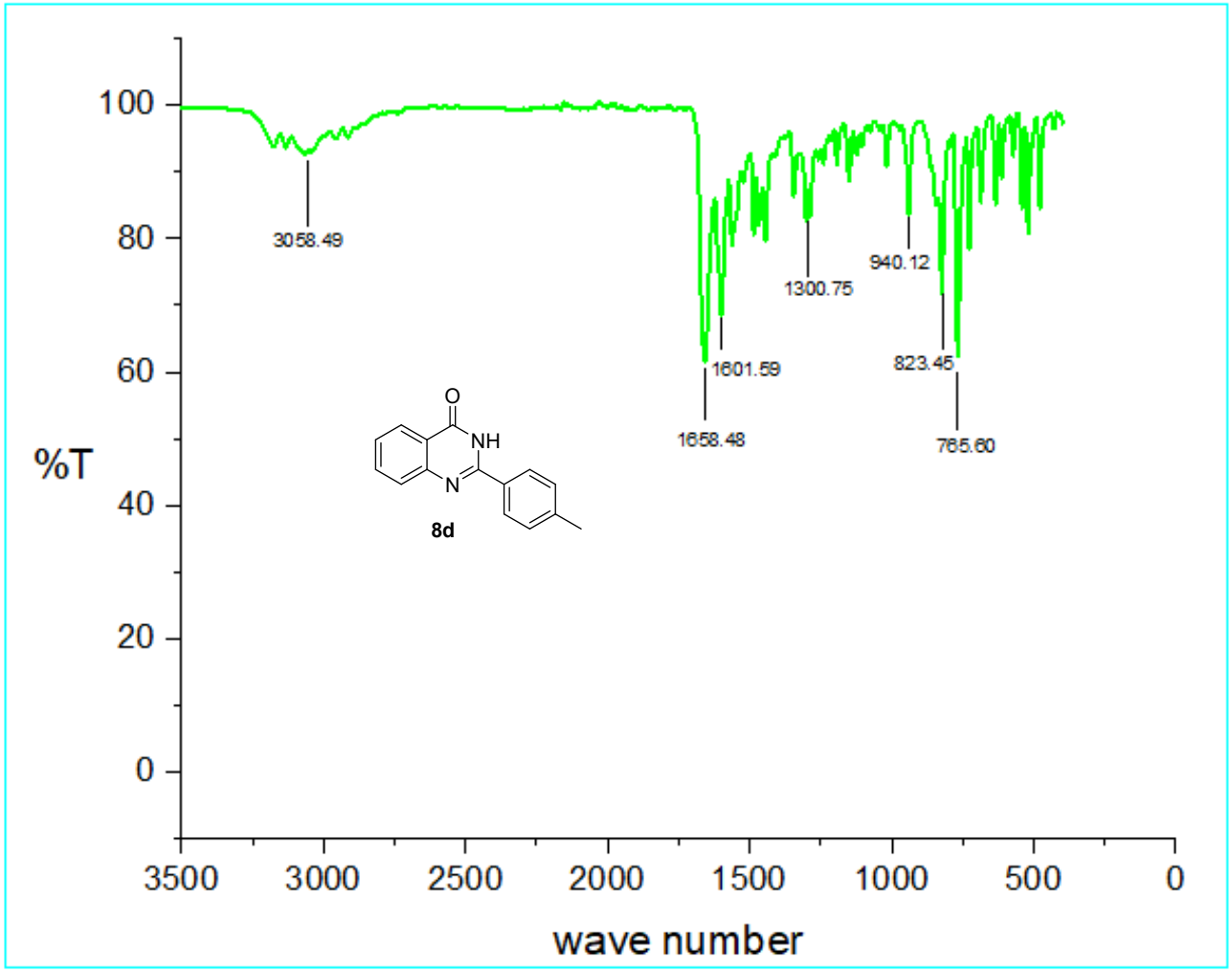

Figure 16: FT-IR spectrum of the compound **8d**.

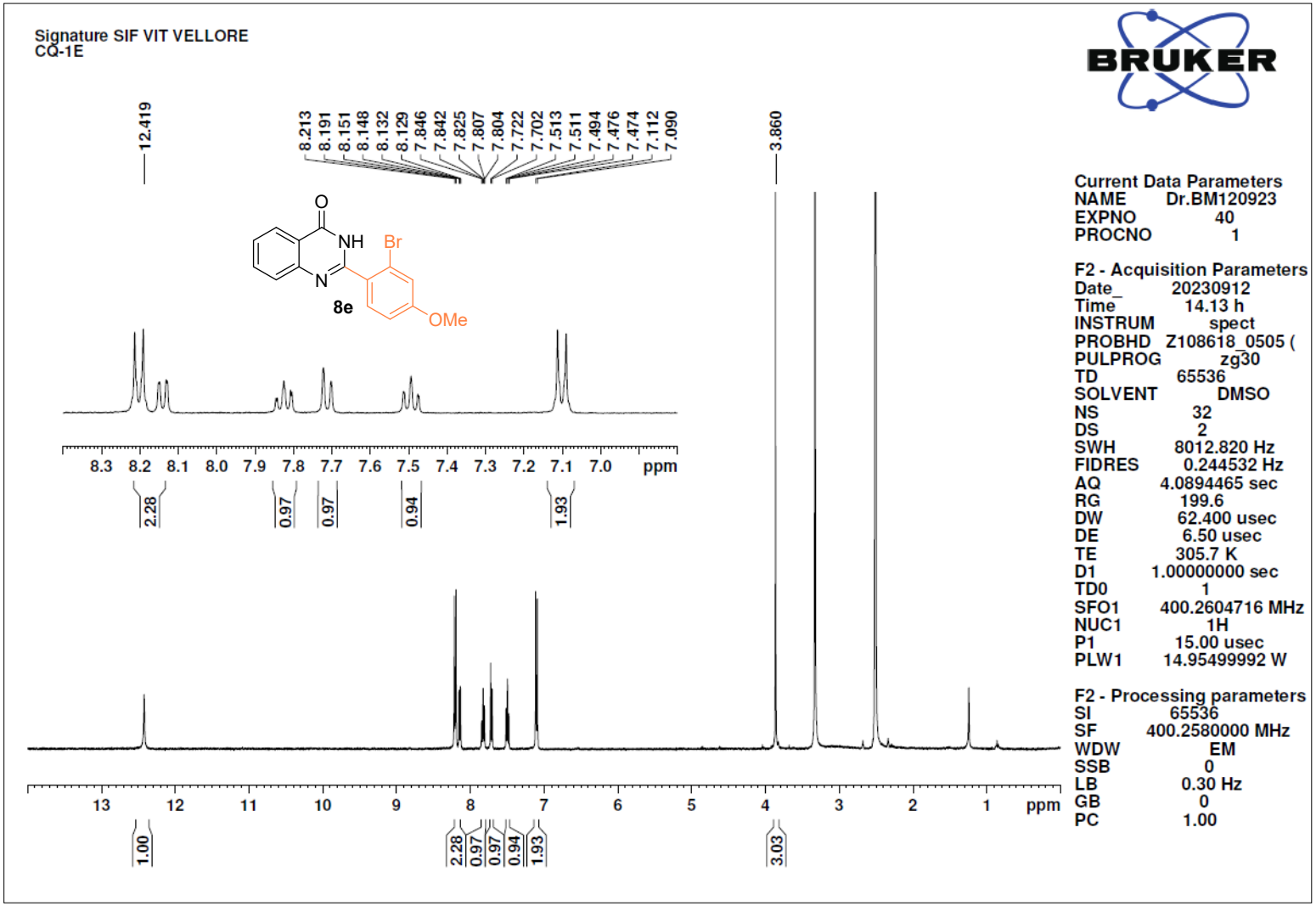

Figure 17: ^{1}H NMR spectrum of the compound **8e**.

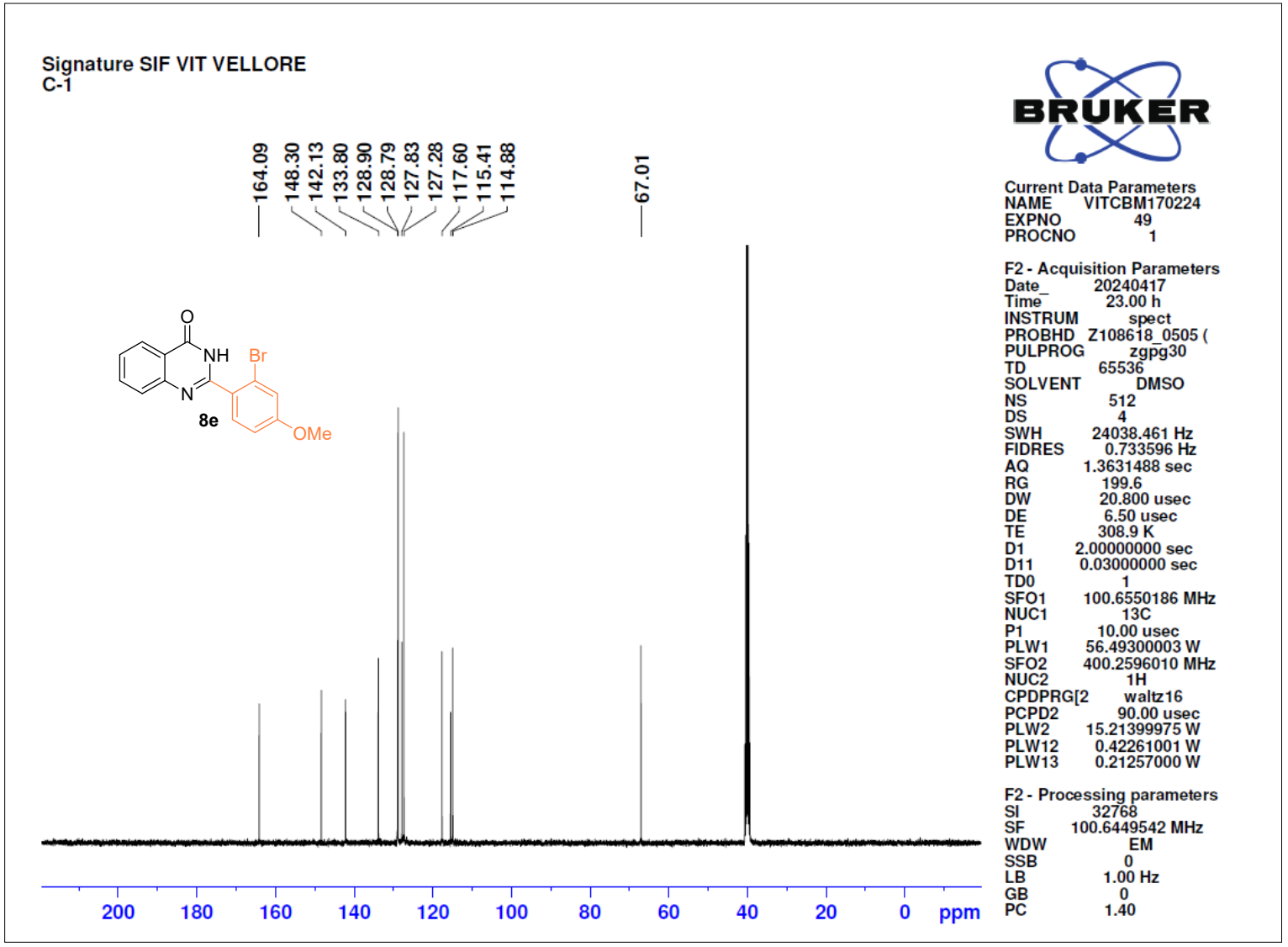

Figure 18: ^{13}C NMR spectrum of the compound **8e**.

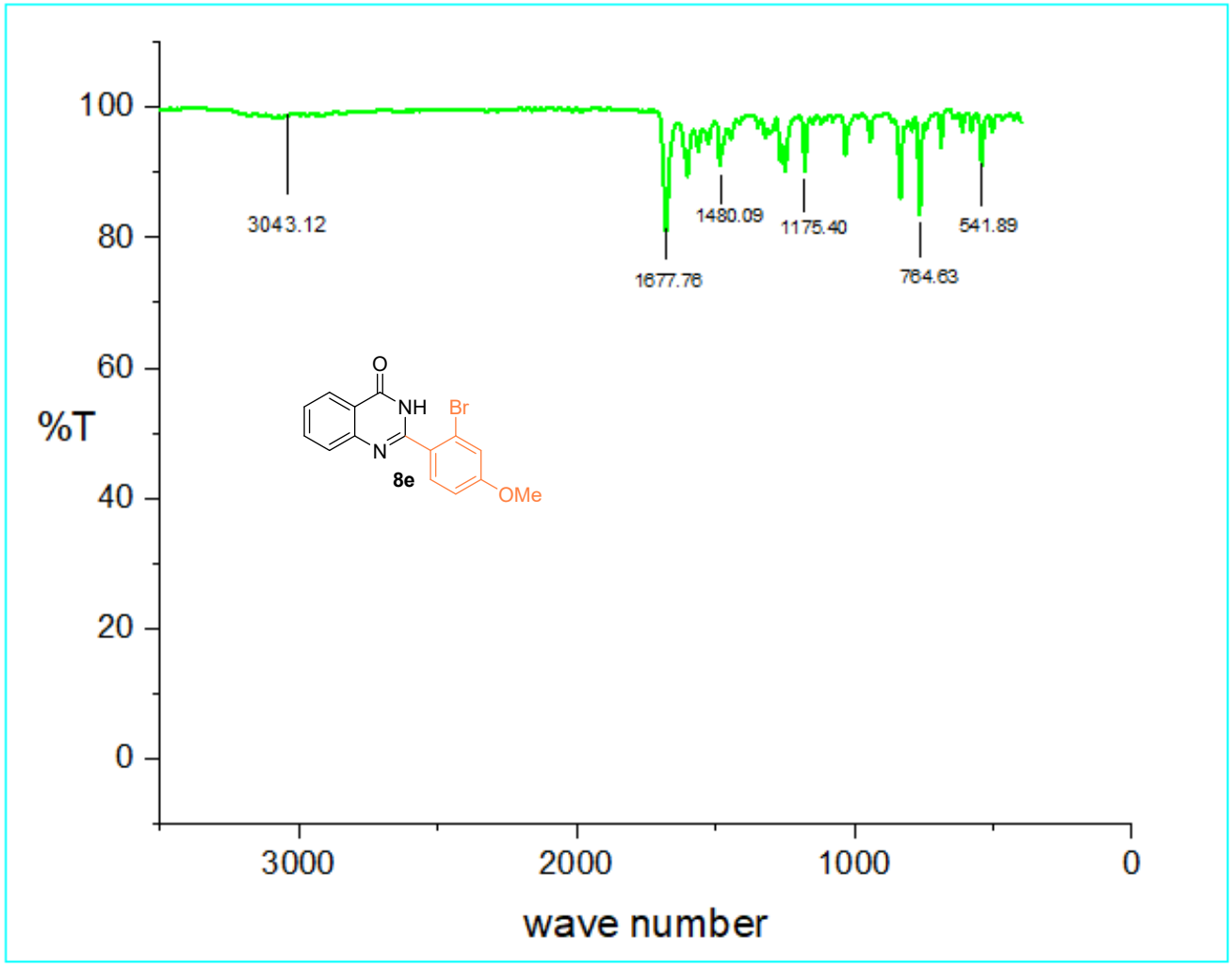

Figure 19: FT-IR spectrum of the compound **8e**.

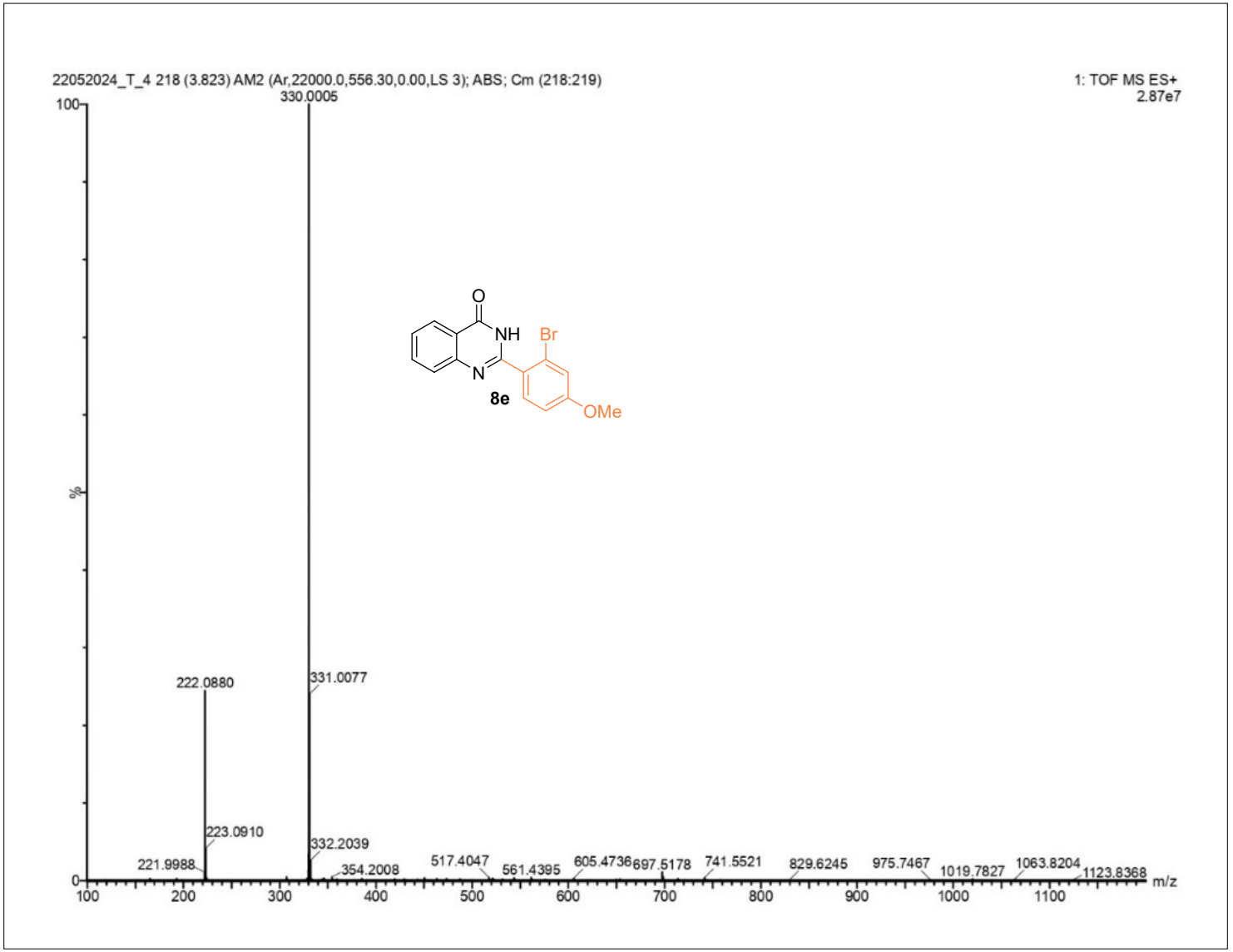

Figure 20: HRMS spectrum of the compound **8e**.

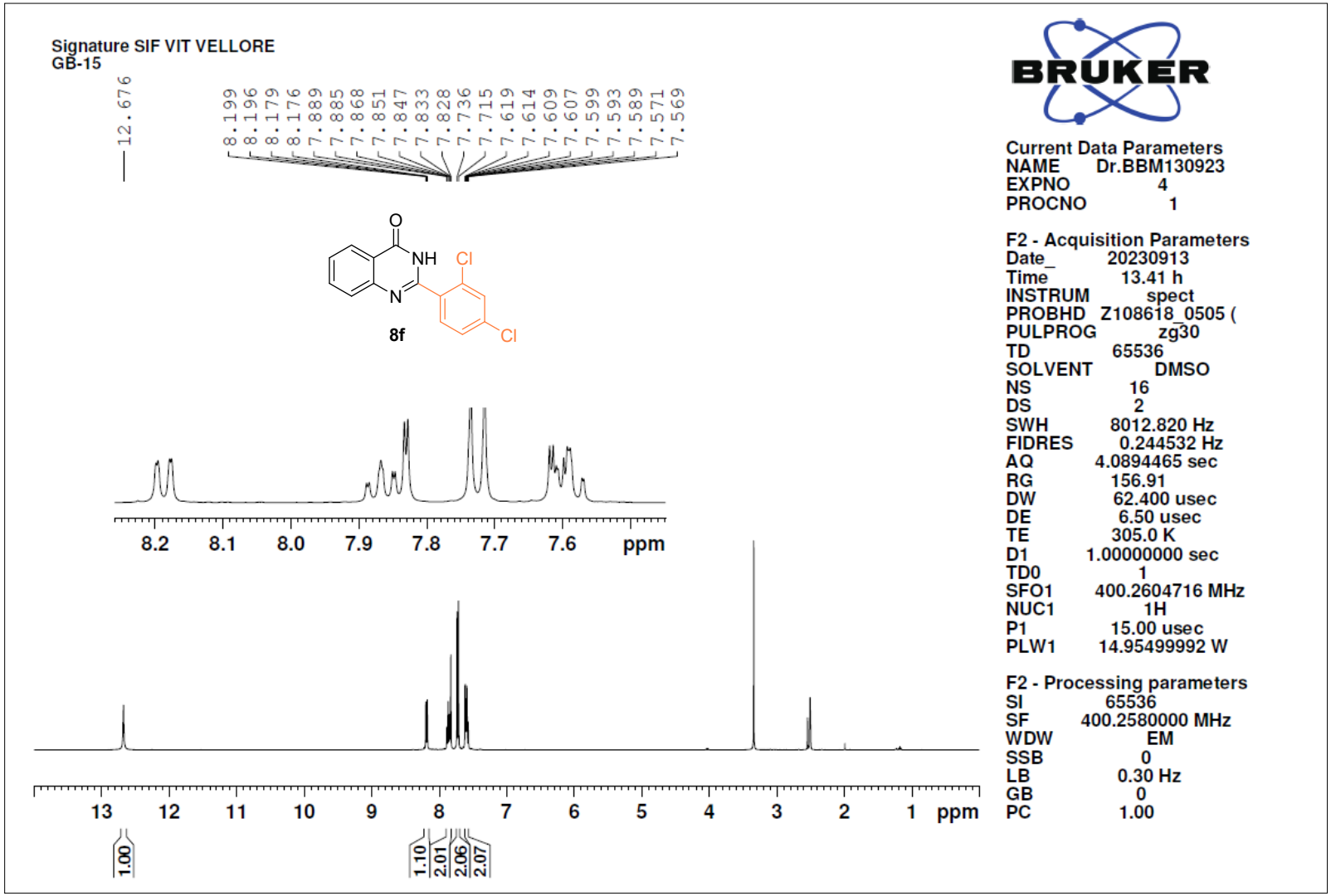

Figure 21: ^{1}H NMR spectrum of the compound **8f**.

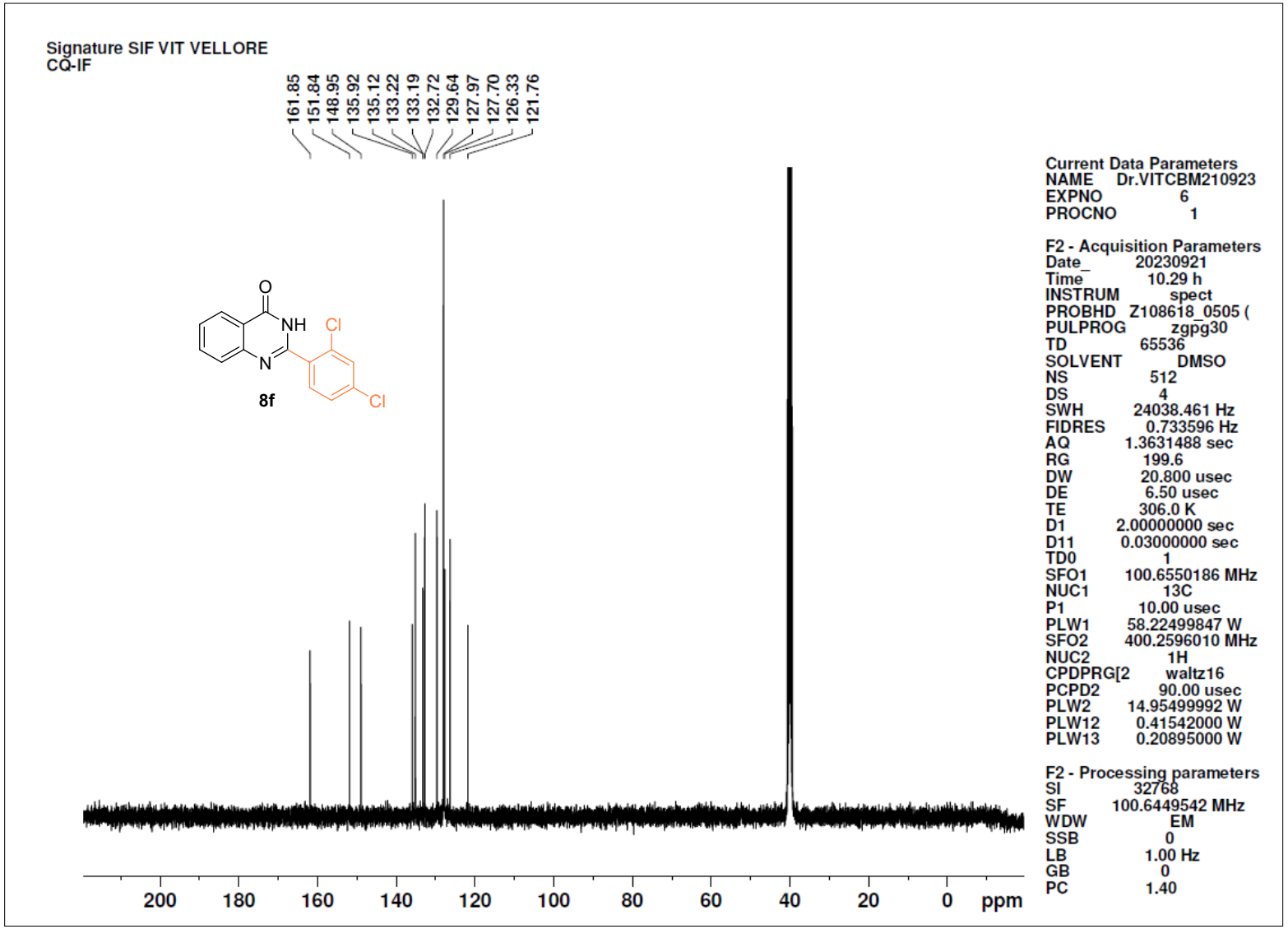

Figure 22: ^{13}C NMR spectrum of the compound **8f**.

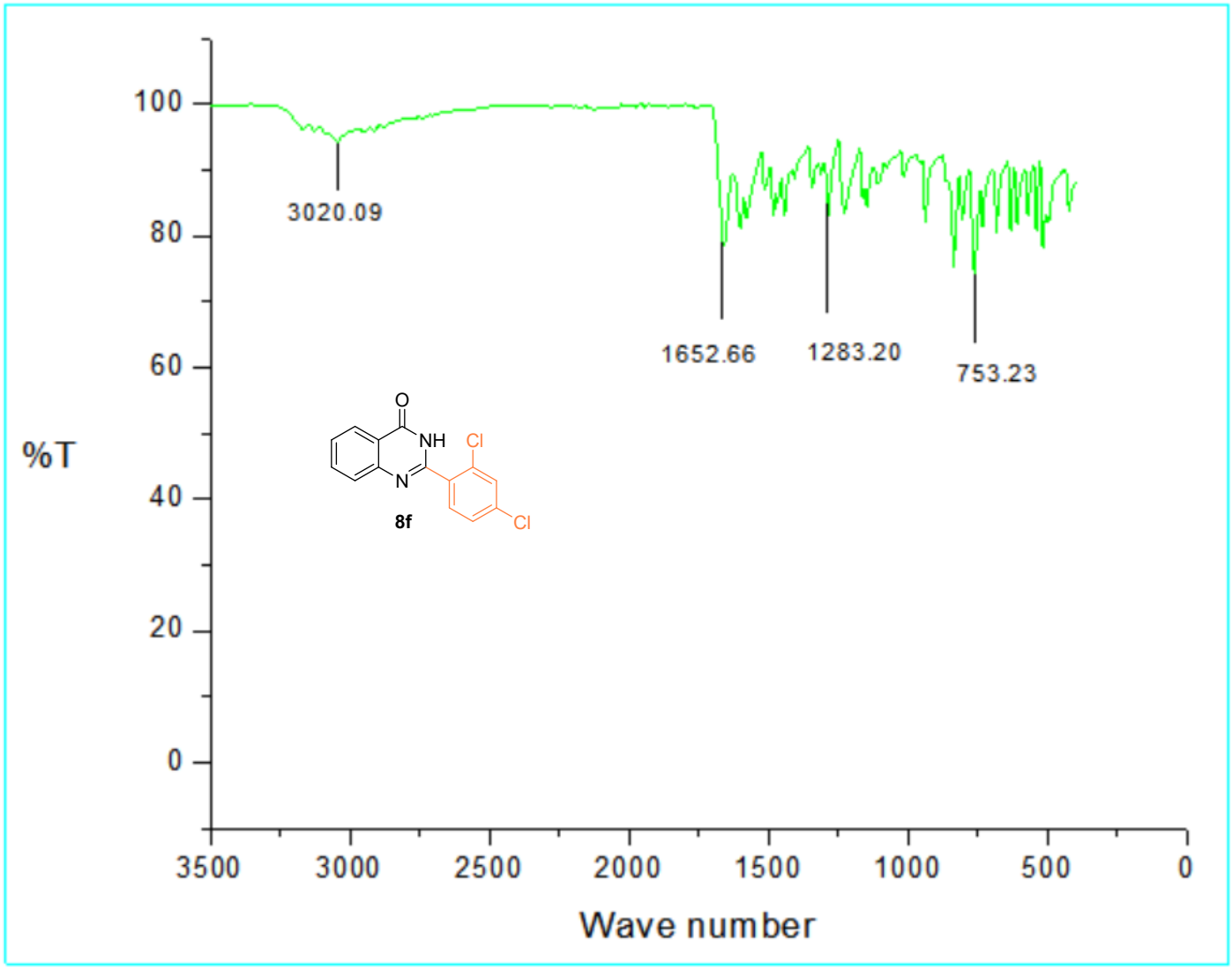

Figure 23: FT-IR spectrum of the compound **8f**.

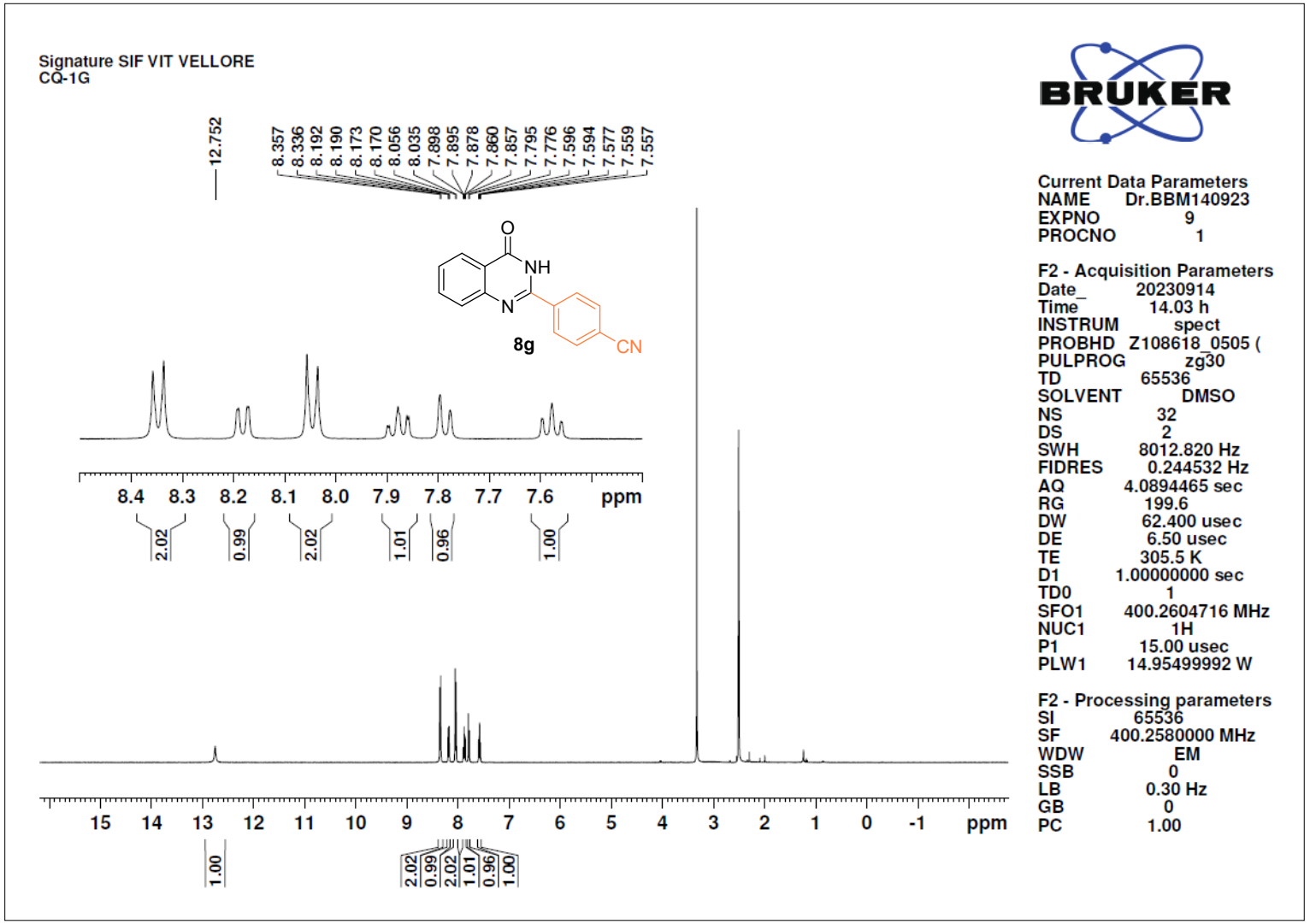

Figure 24: ^{1}H NMR spectrum of the compound **8g**.

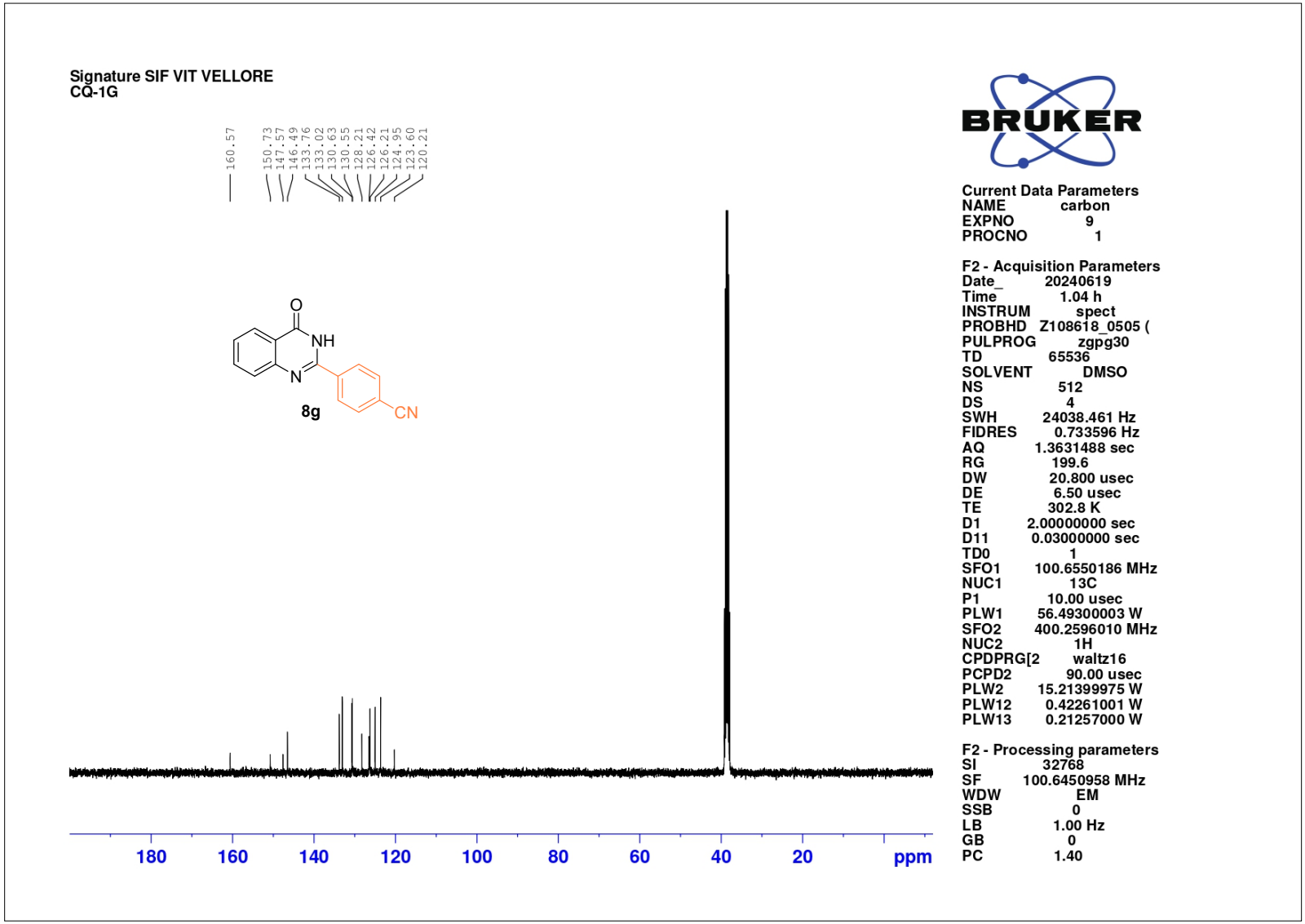

Figure 25: ^{13}C NMR spectrum of the compound **8g**.

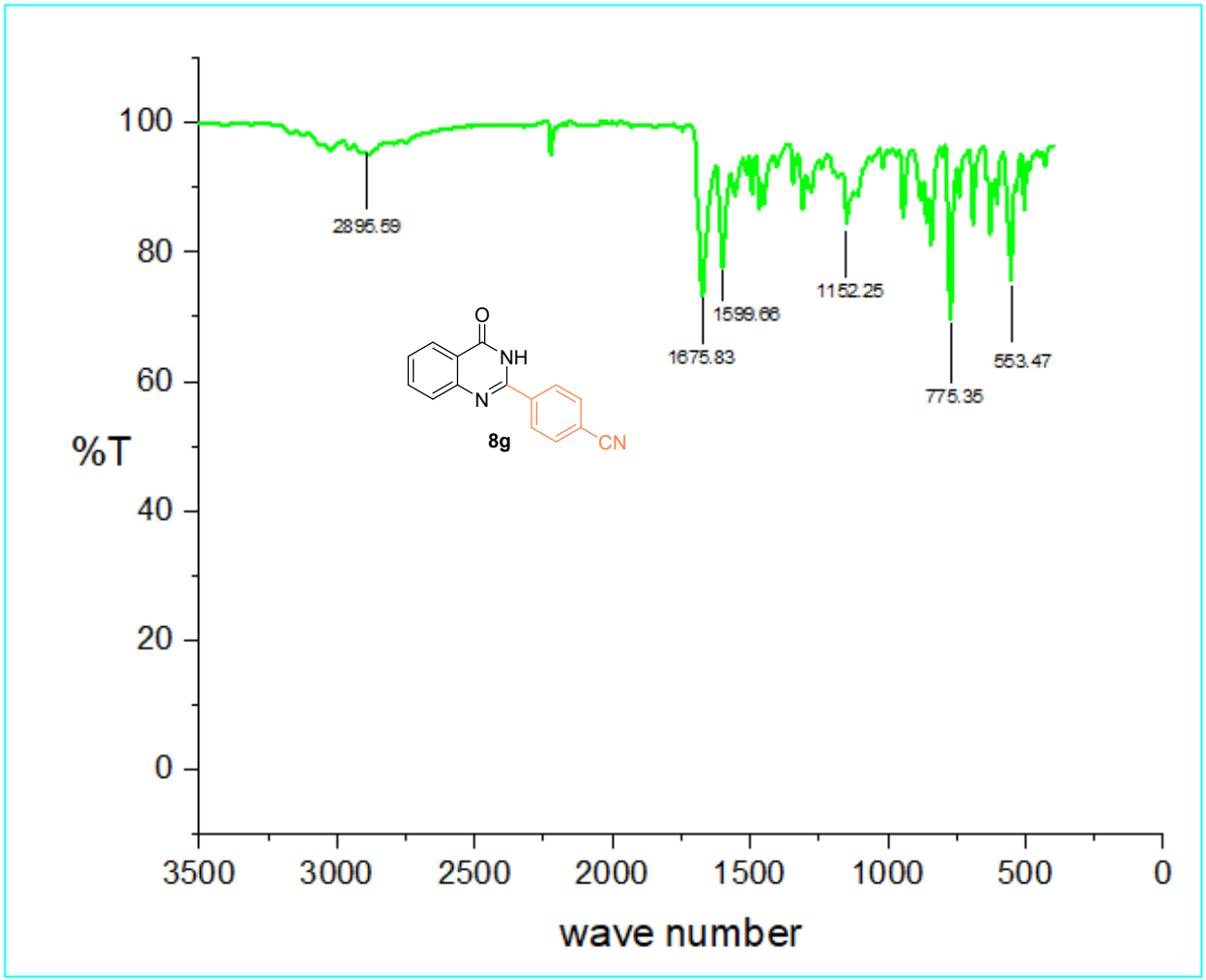

Figure 26: FT-IR spectrum of the compound **8g**.

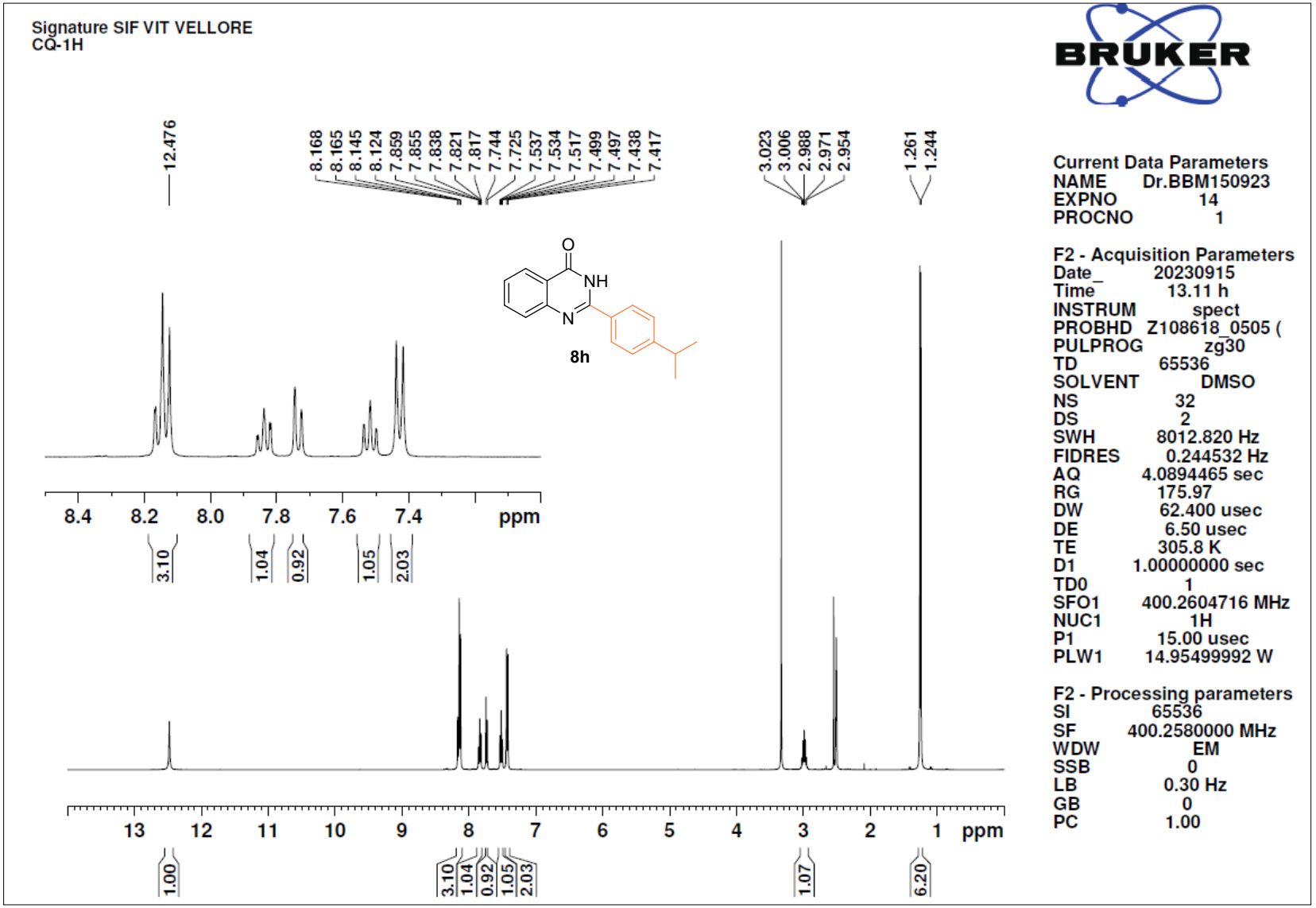

Figure 27: ^{1}H NMR spectrum of the compound **8h**.

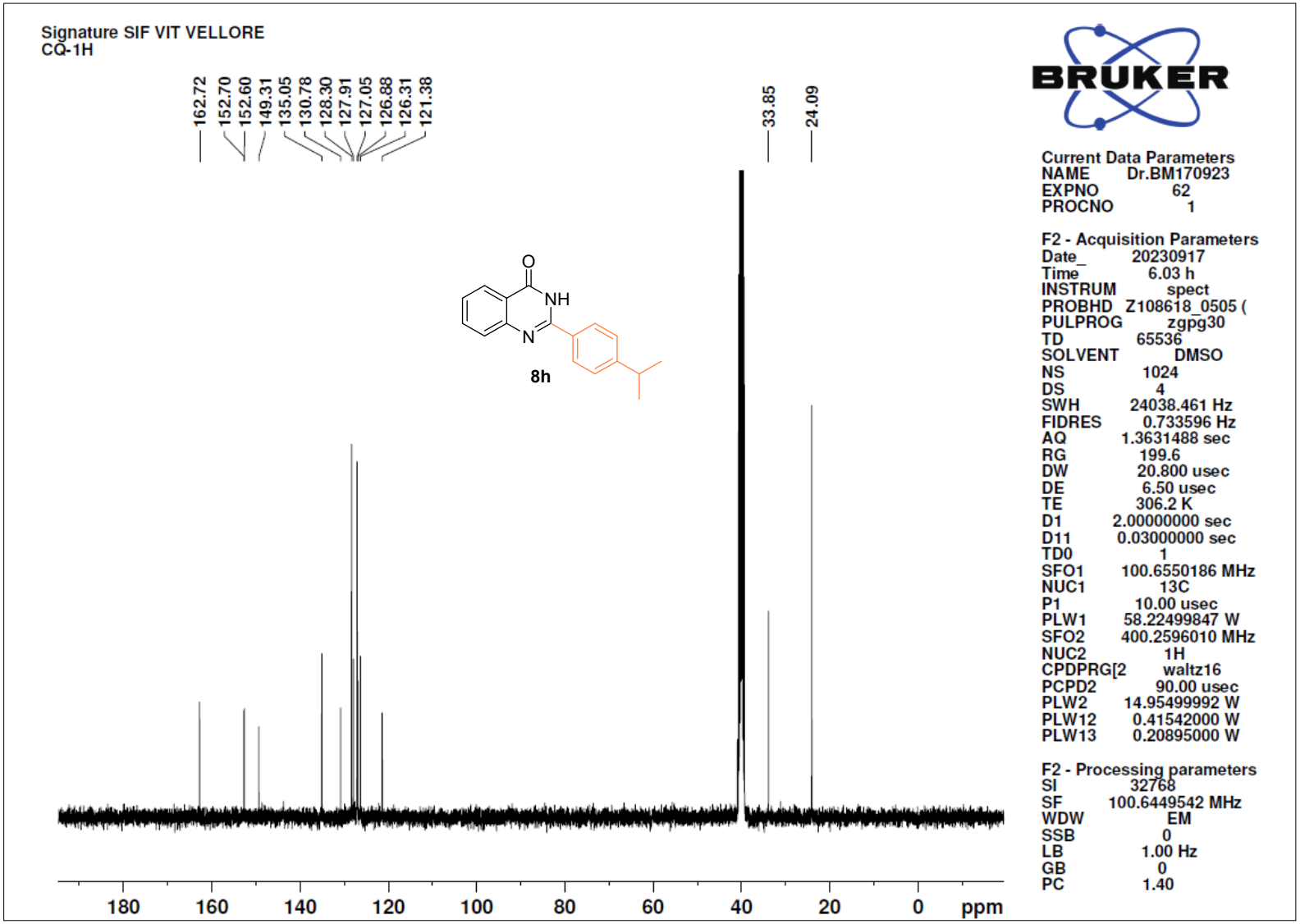

Figure 28: ^{13}C NMR spectrum of the compound **8h**.

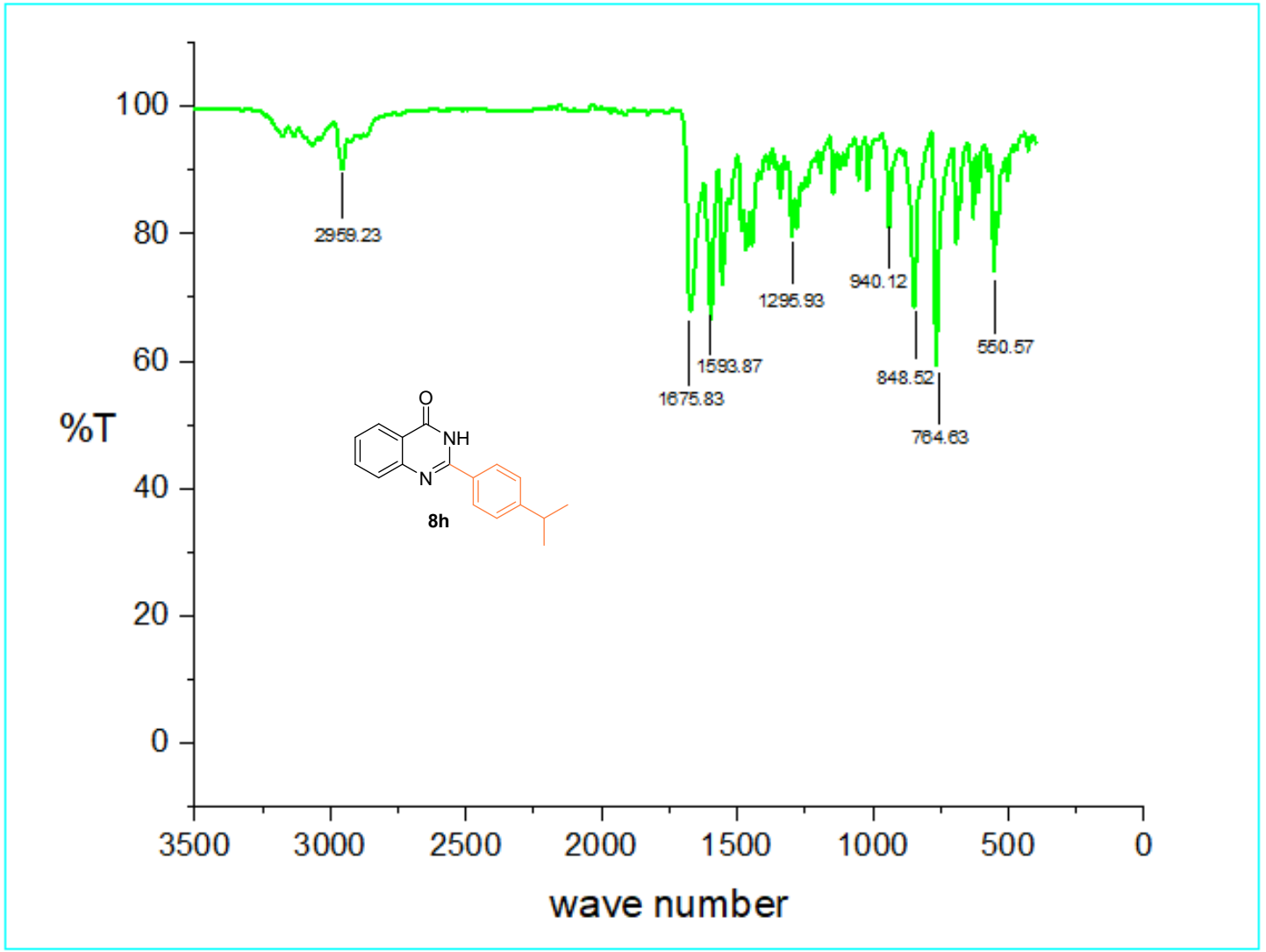

Figure 29: FT-IR spectrum of the compound **8h**.

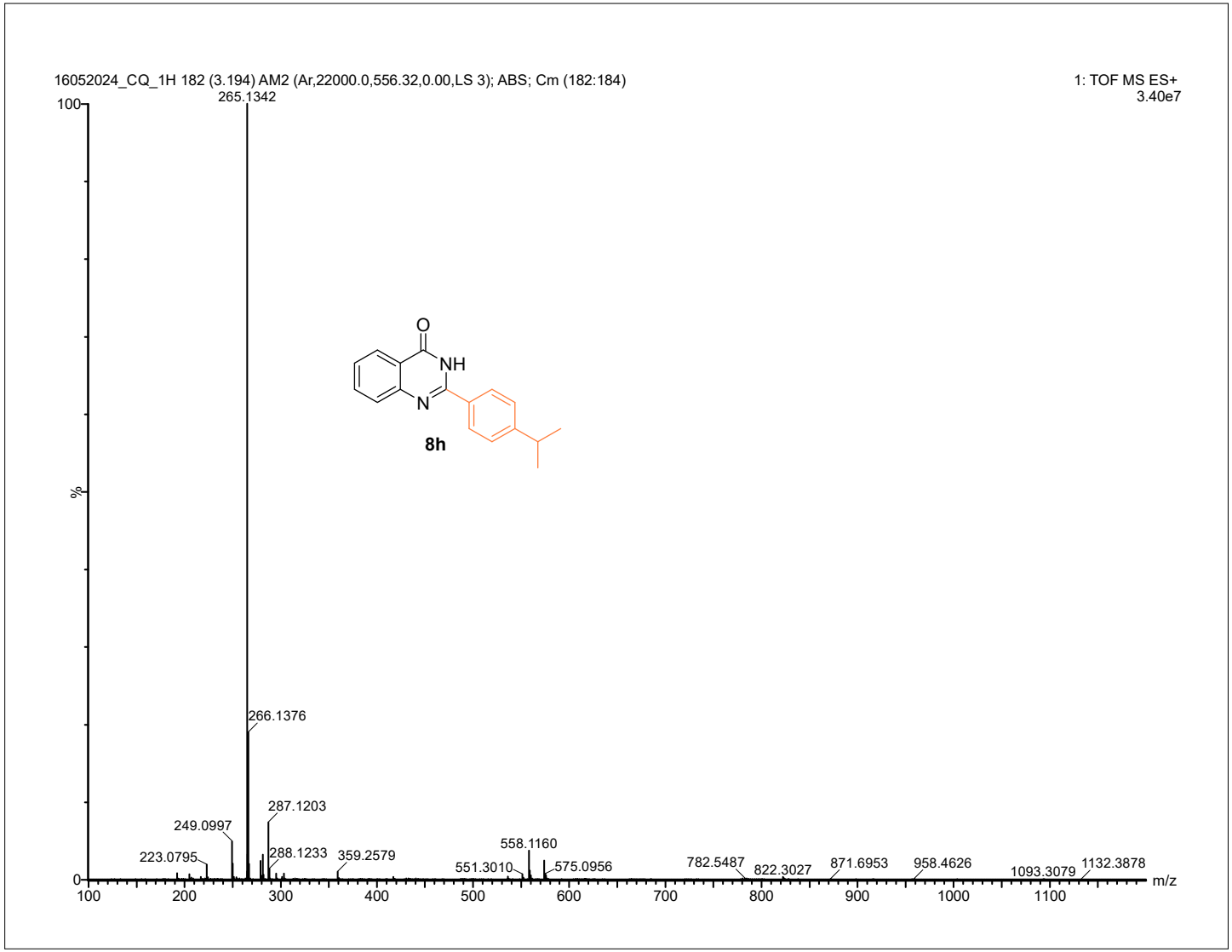

Figure 30: HRMS spectrum of the compound **8h**.

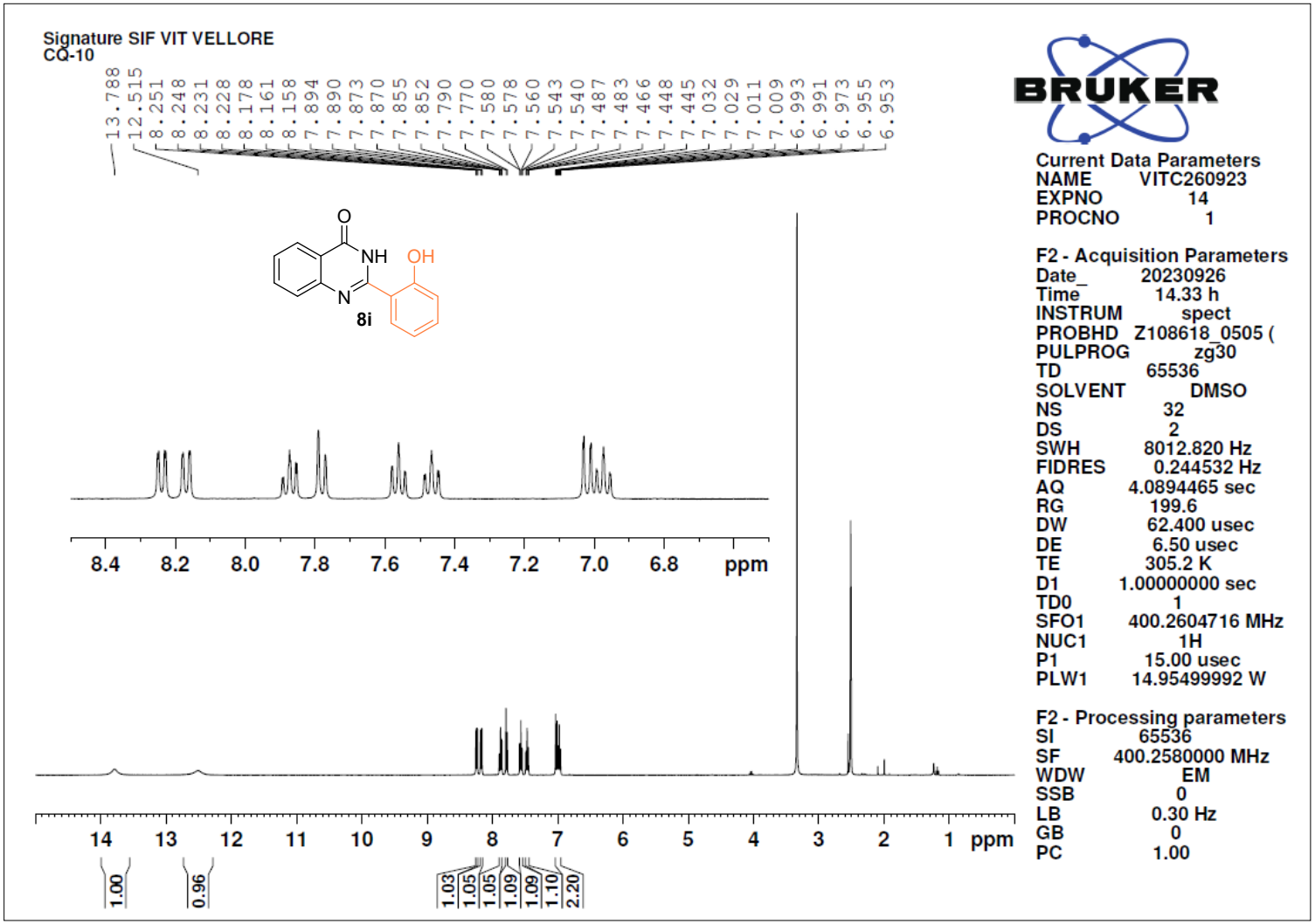

Figure 31: ^{1}H NMR spectrum of the compound **8i**.

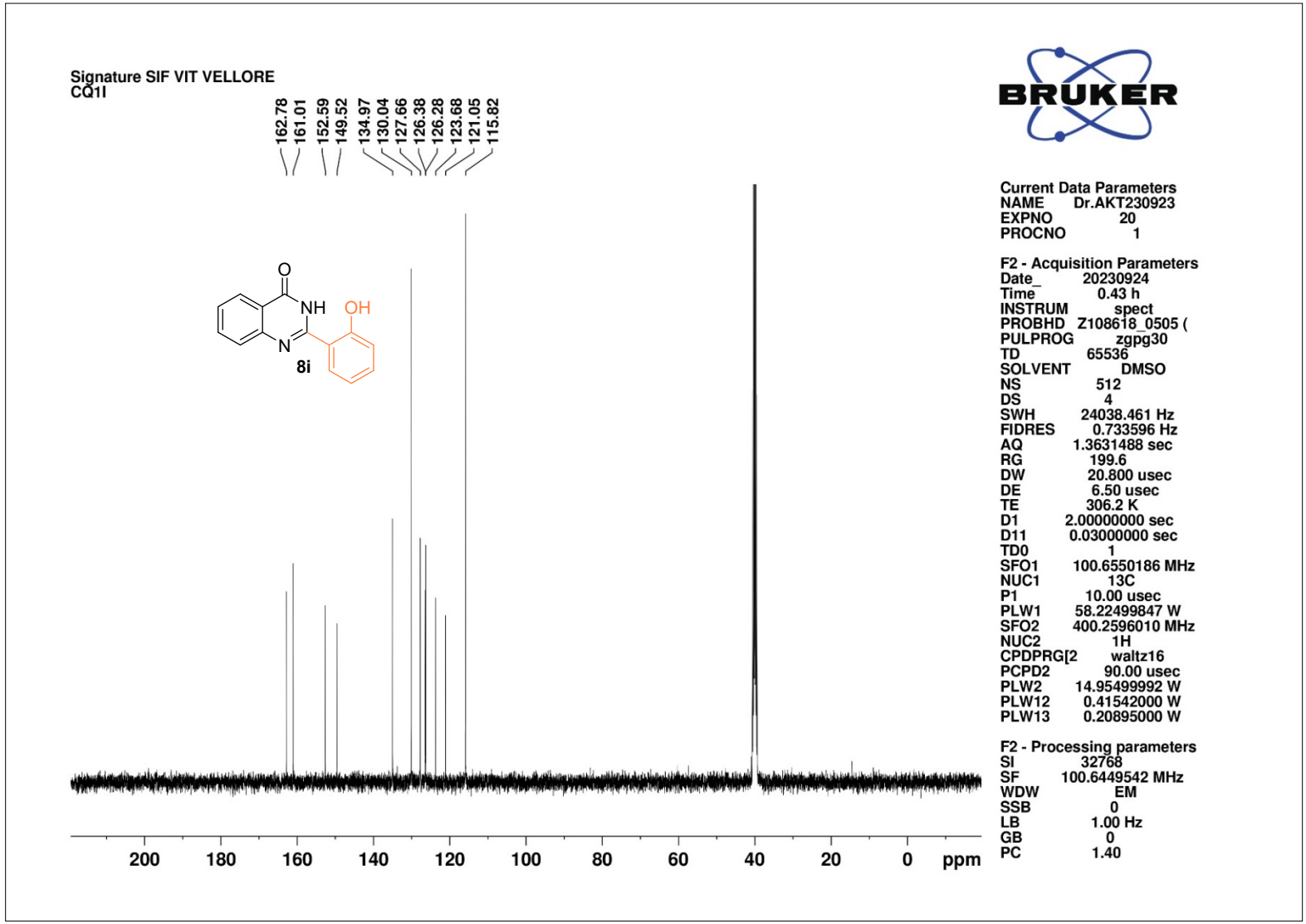

Figure 32: ^{13}C NMR spectrum of the compound **8i**.

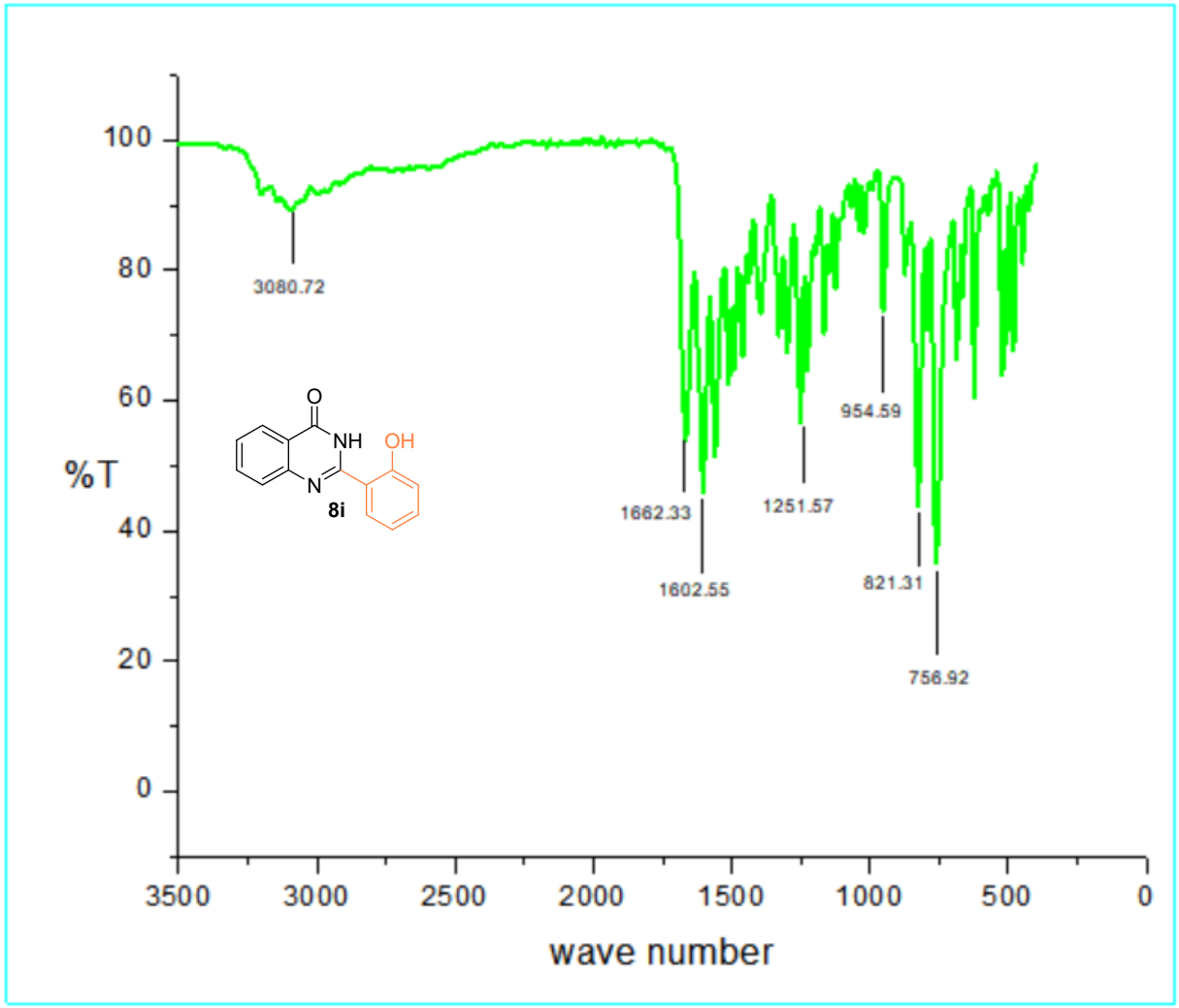

Figure 33: FT-IR spectrum of the compound **8i**.

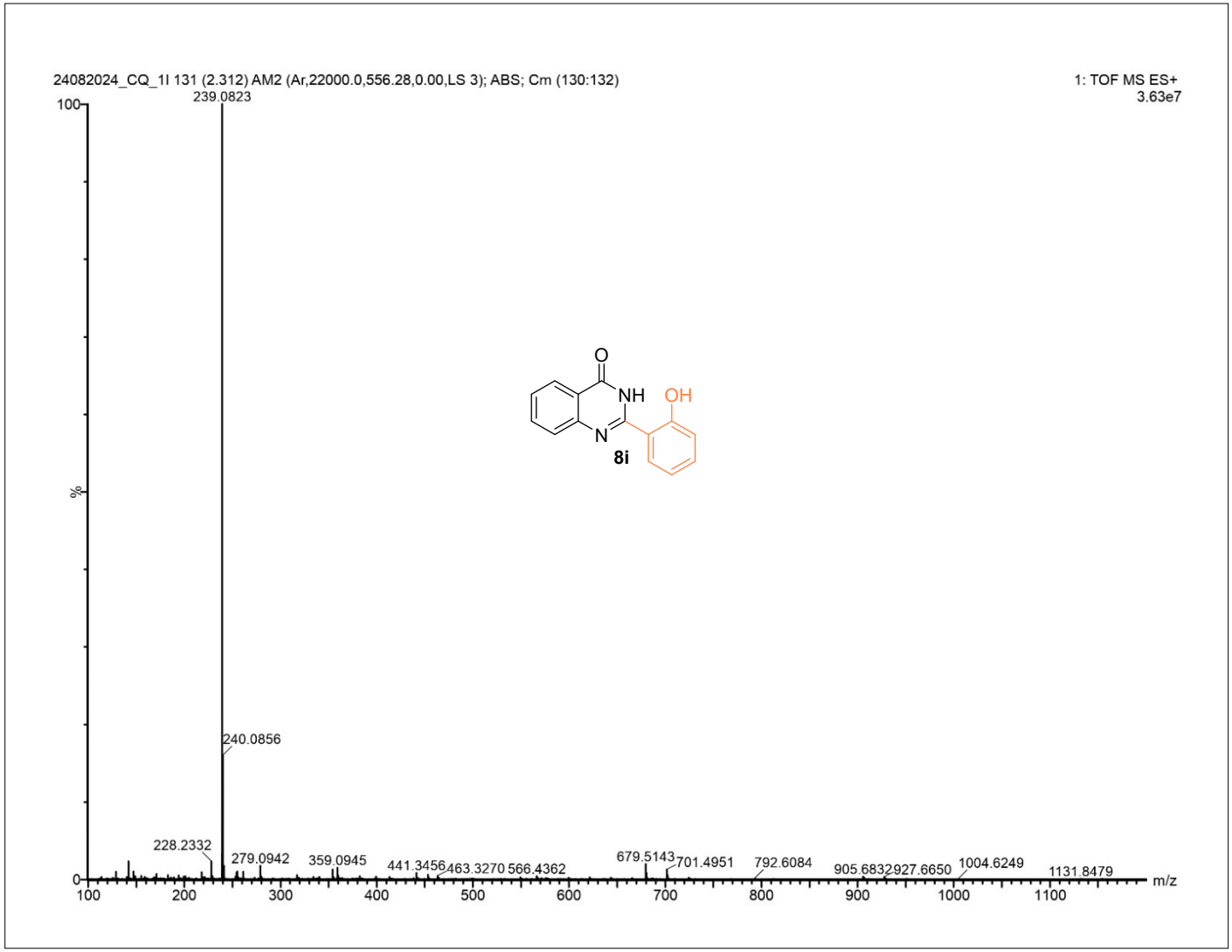

Figure 34: FT-IR spectrum of the compound **8i**.

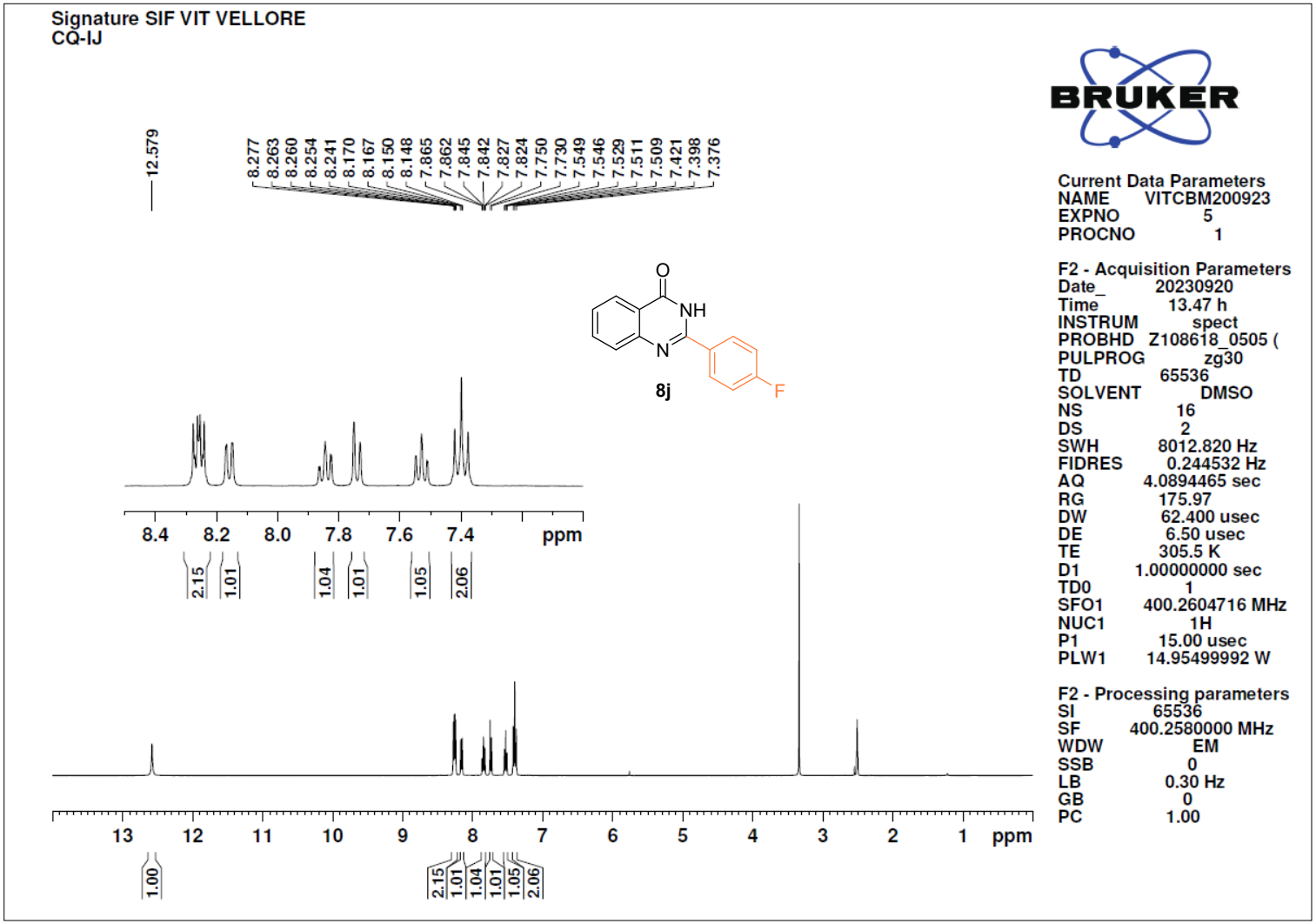

Figure 35: ^{1}H NMR spectrum of the compound **8j**.

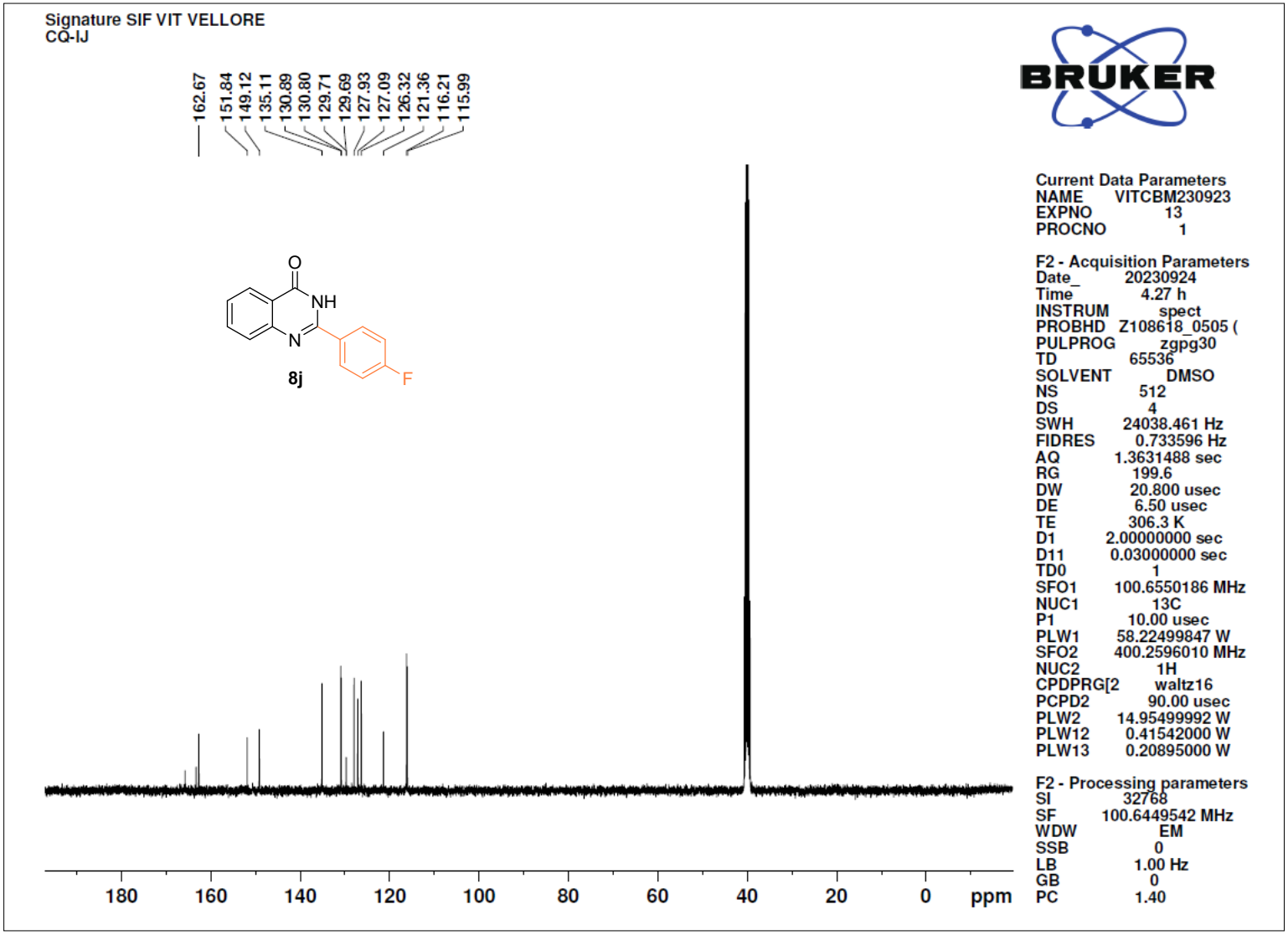

Figure 36: ^{13}C NMR spectrum of the compound **8j**.

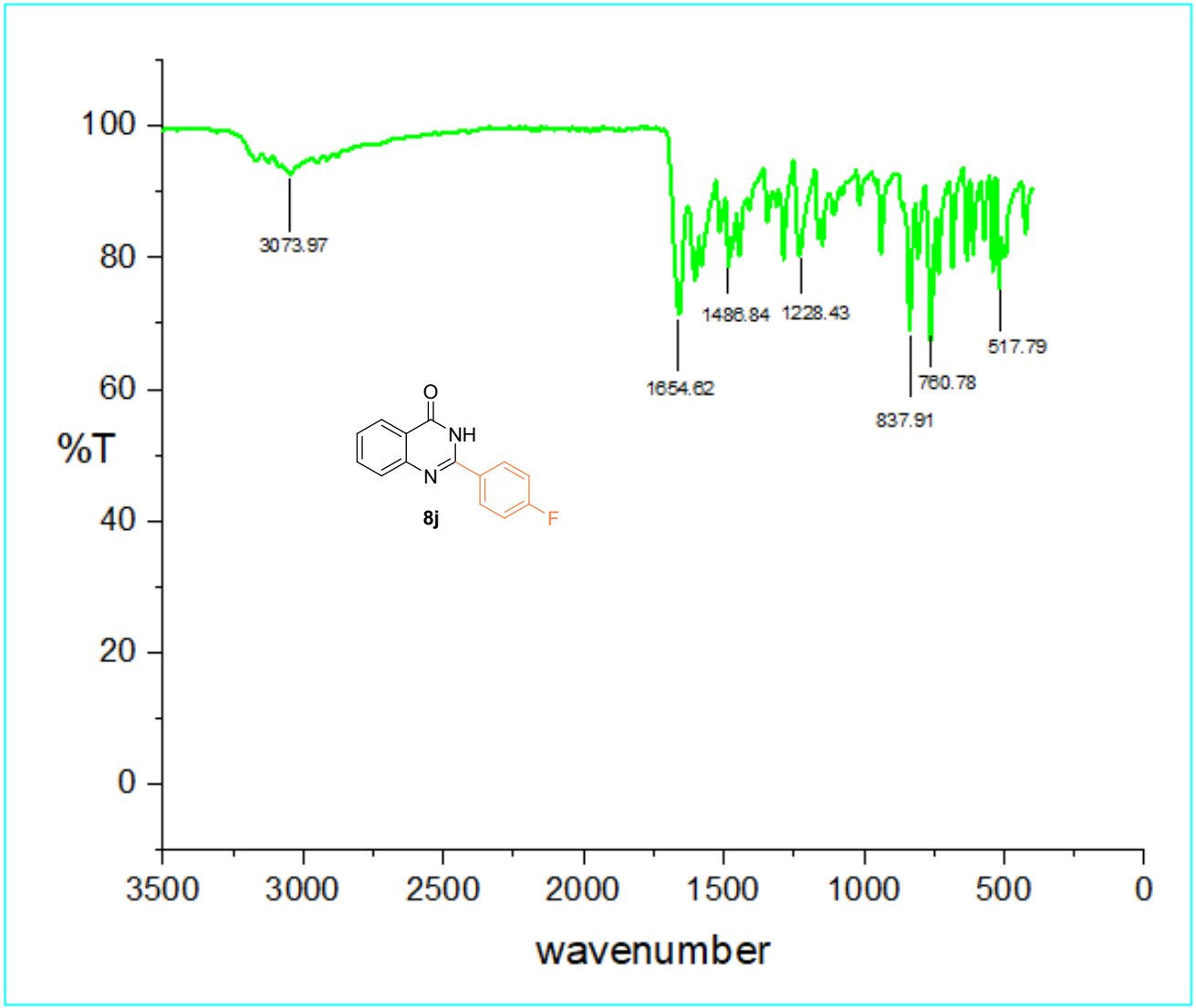

Figure 37: FT-IR spectrum of the compound **8j**.

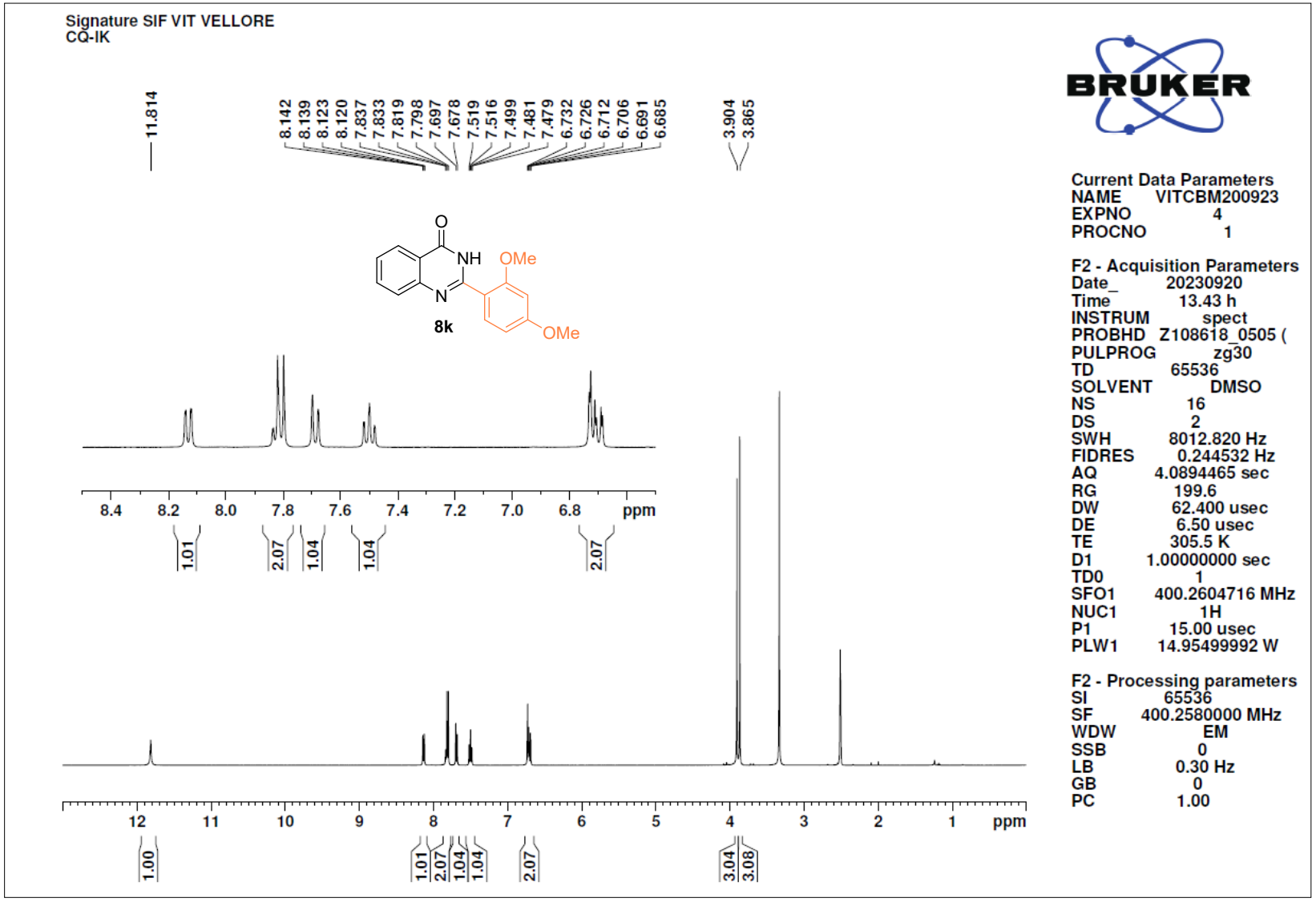

Figure 38: ^{1}H NMR spectrum of the compound **8k**.

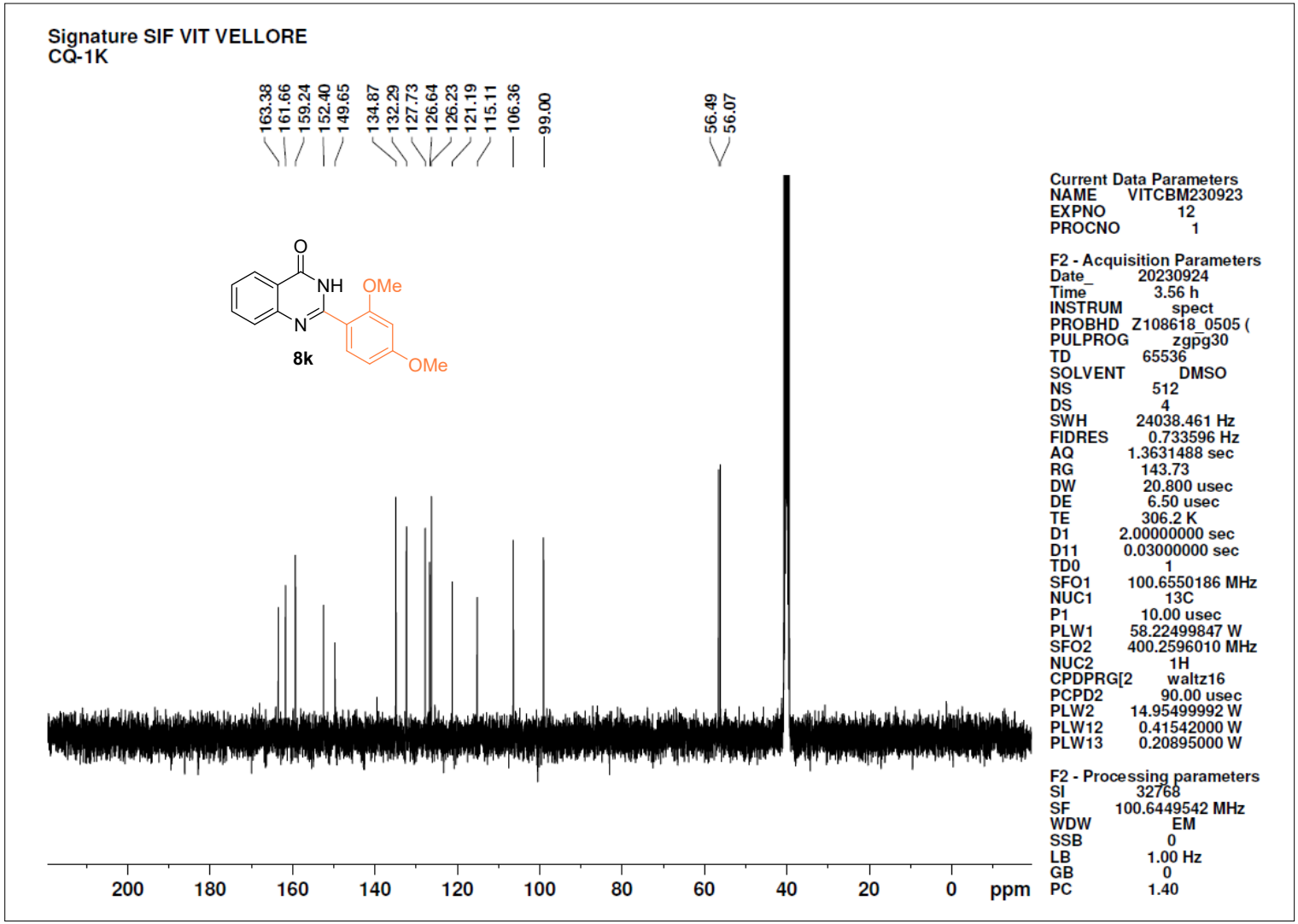

Figure 39: ^{13}C NMR spectrum of the compound **8k**.

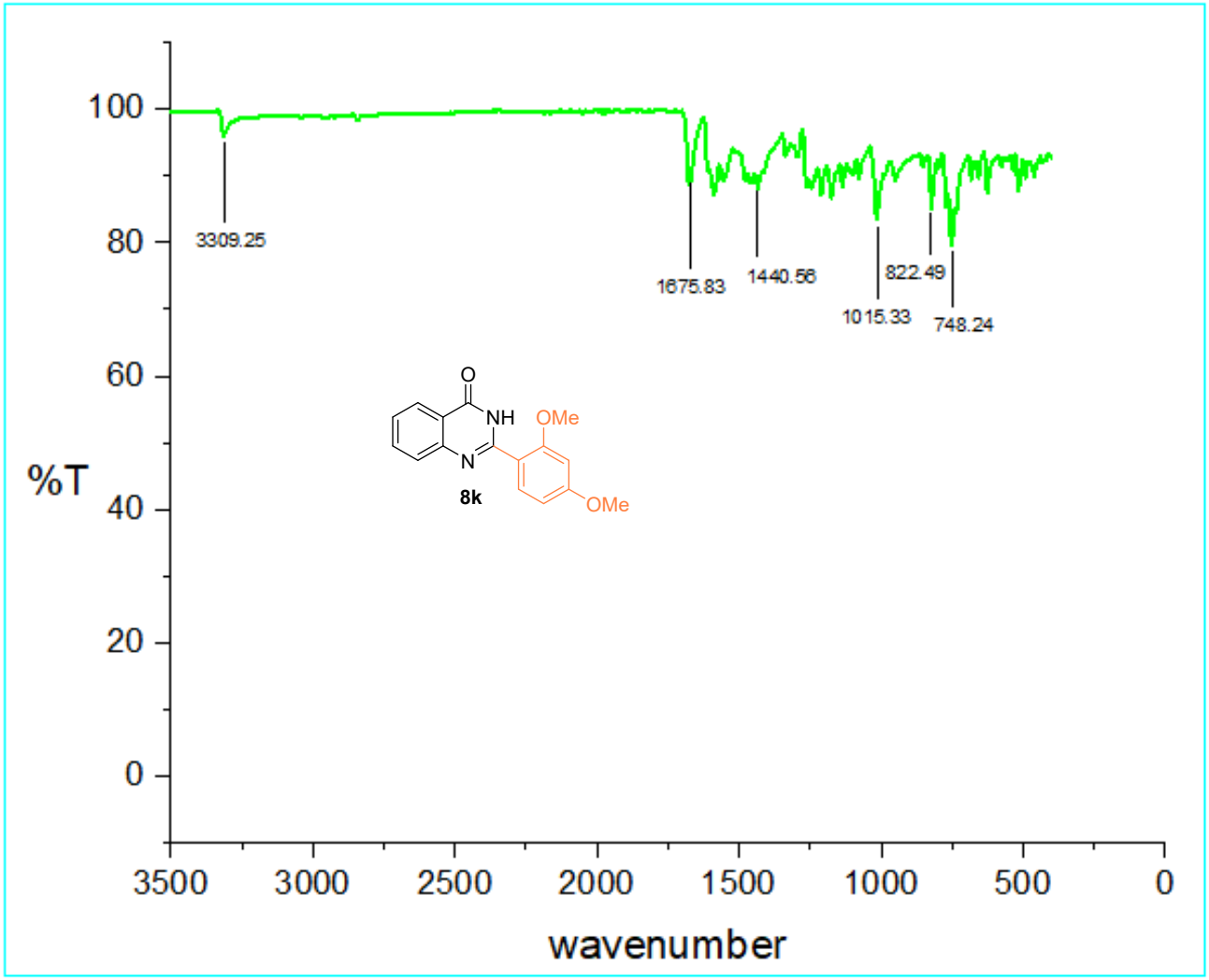

Figure 40: FT-IR spectrum of the compound **8k**.

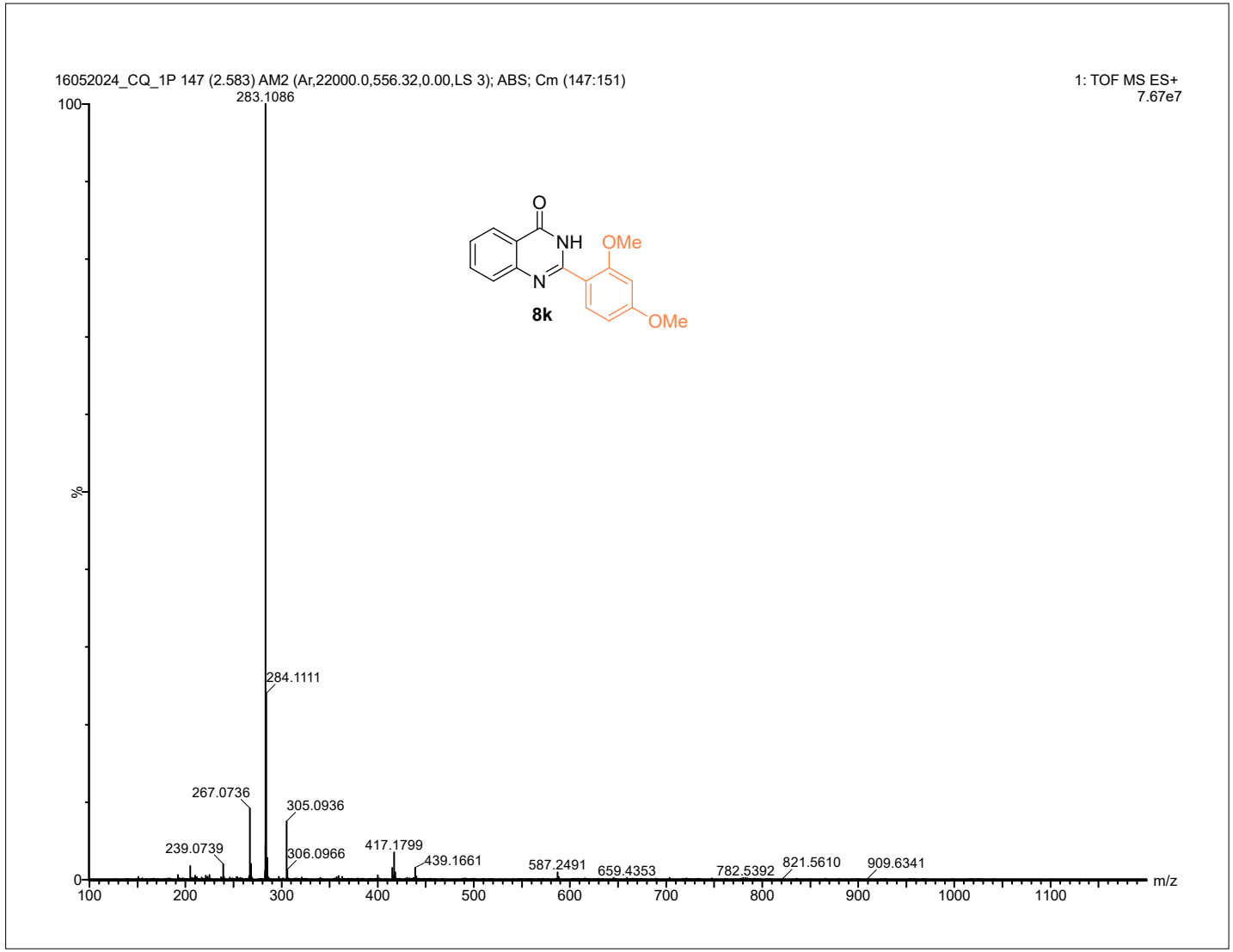

Figure 41: HRMS of the compound **8k**.

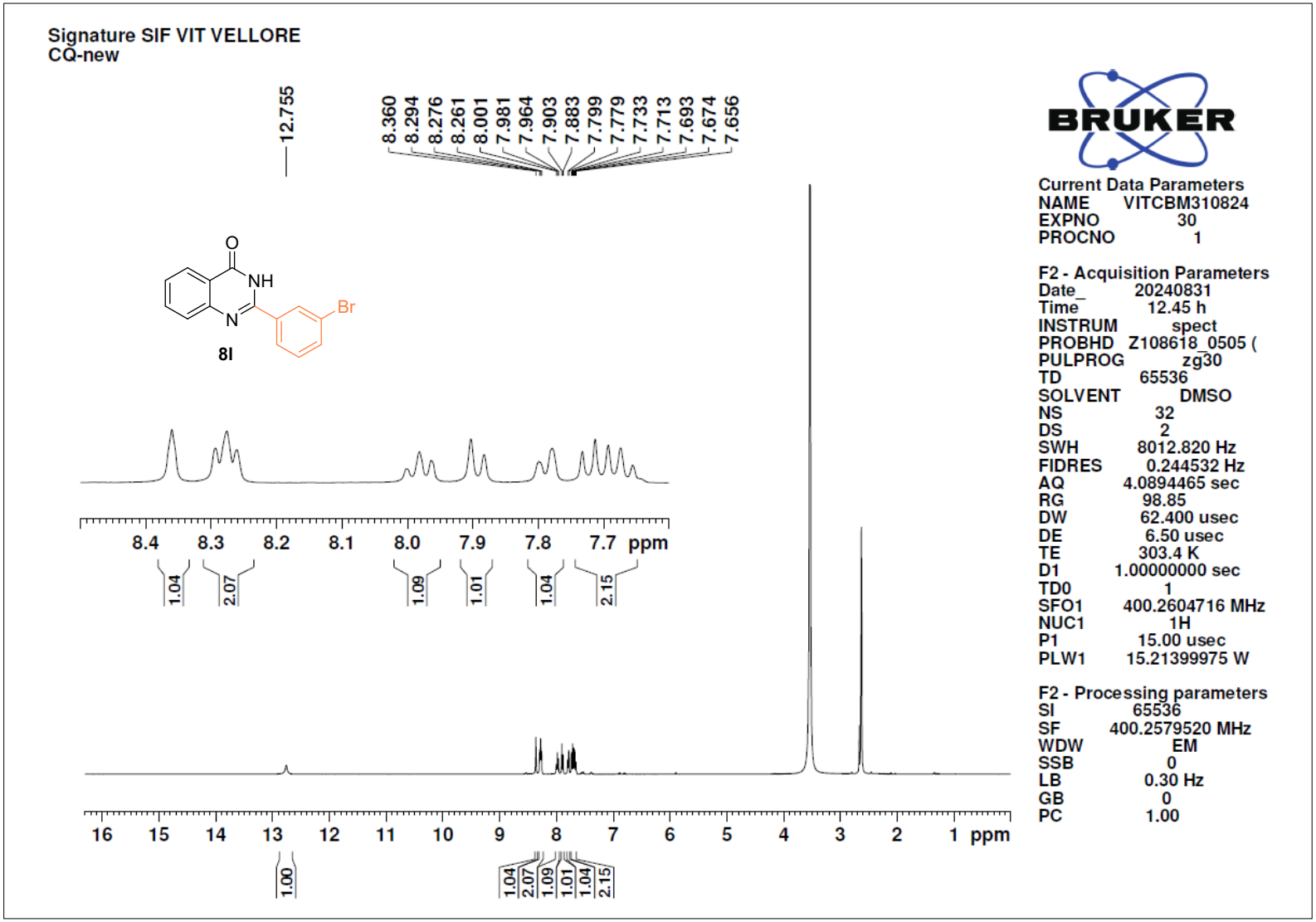

Figure 42: ^{1}H NMR spectrum of the compound **8l**.

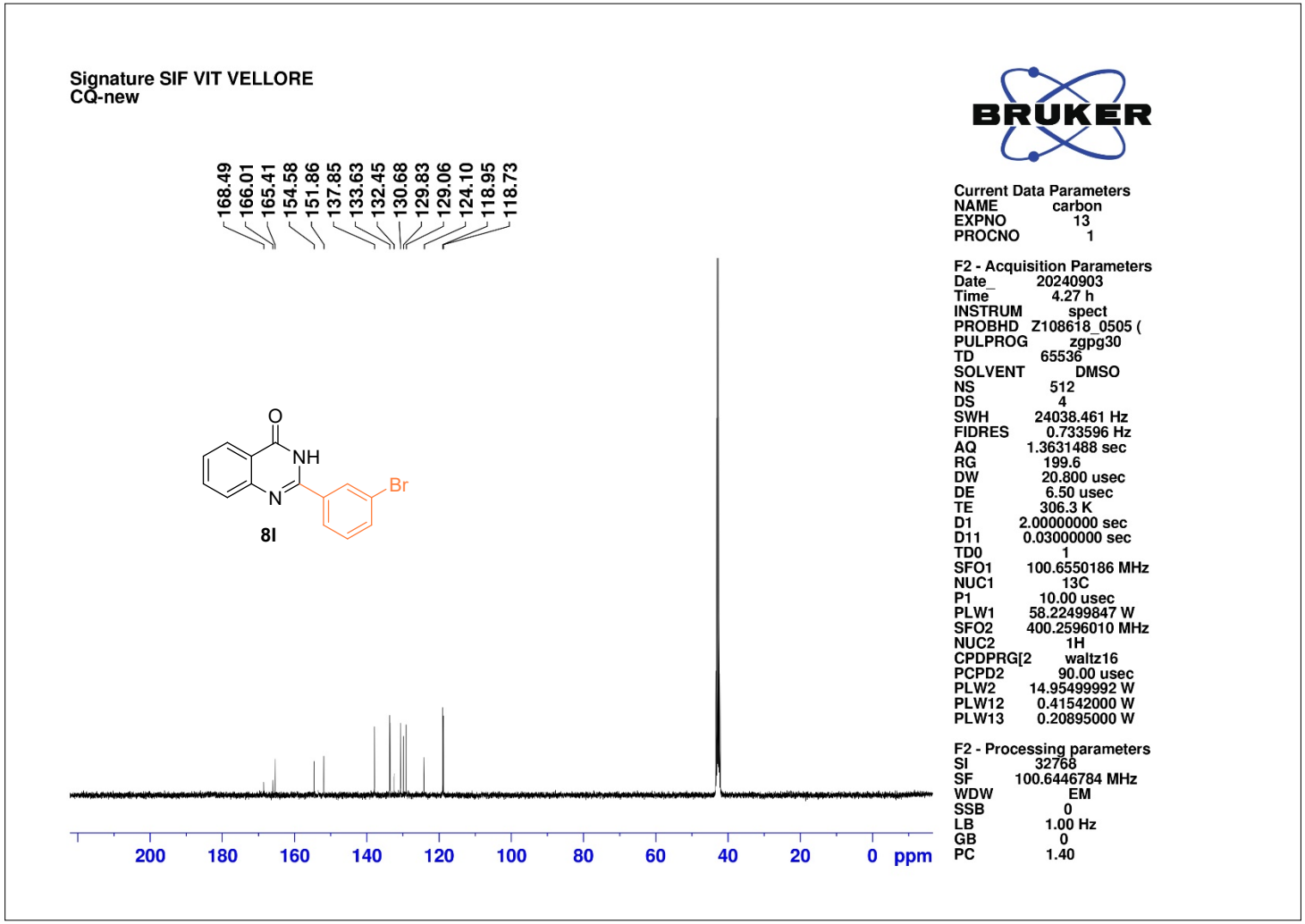

Figure 43: ^{13}C NMR spectrum of the compound **8l**.

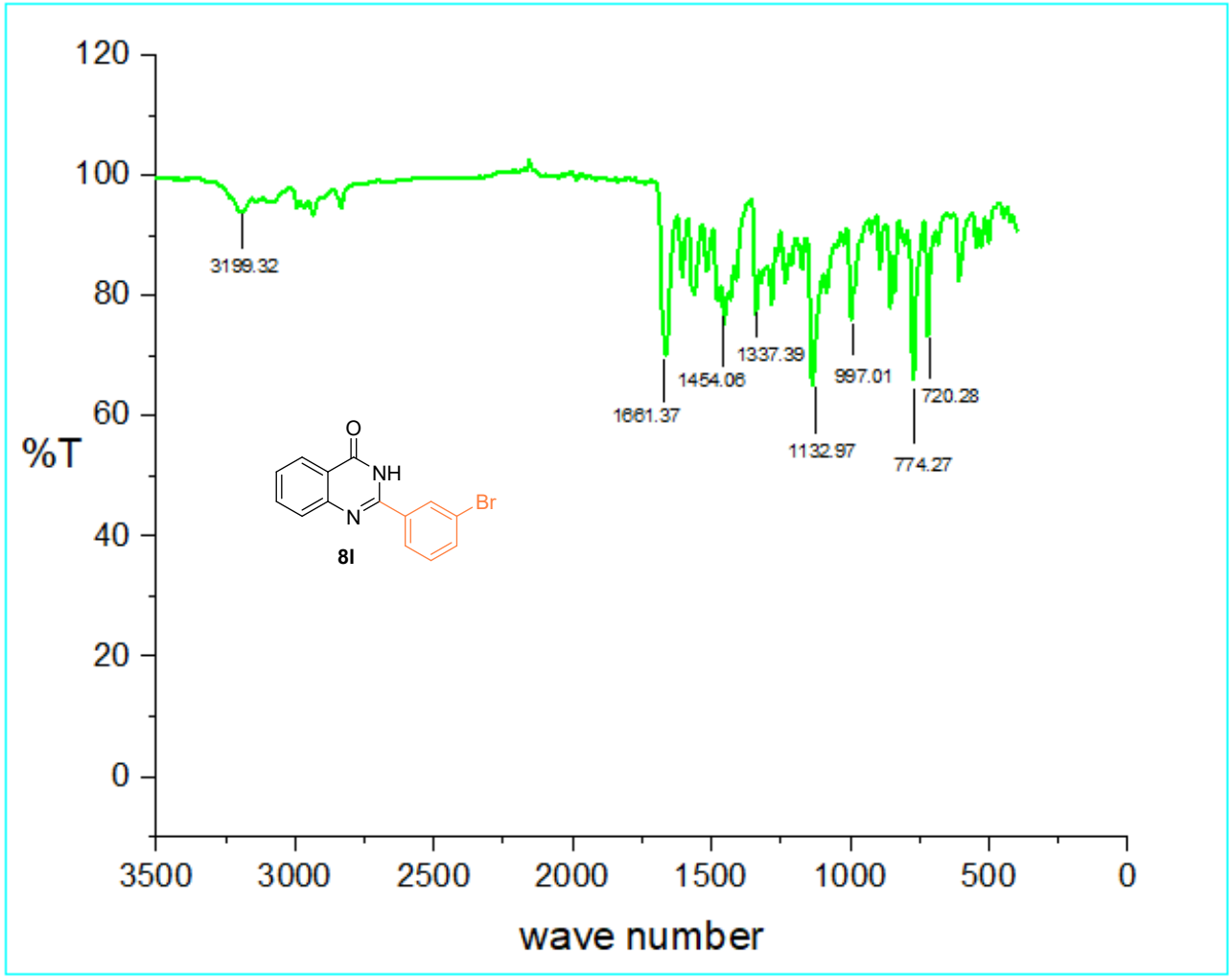

Figure 44: FT-IR spectrum of the compound **8l**.

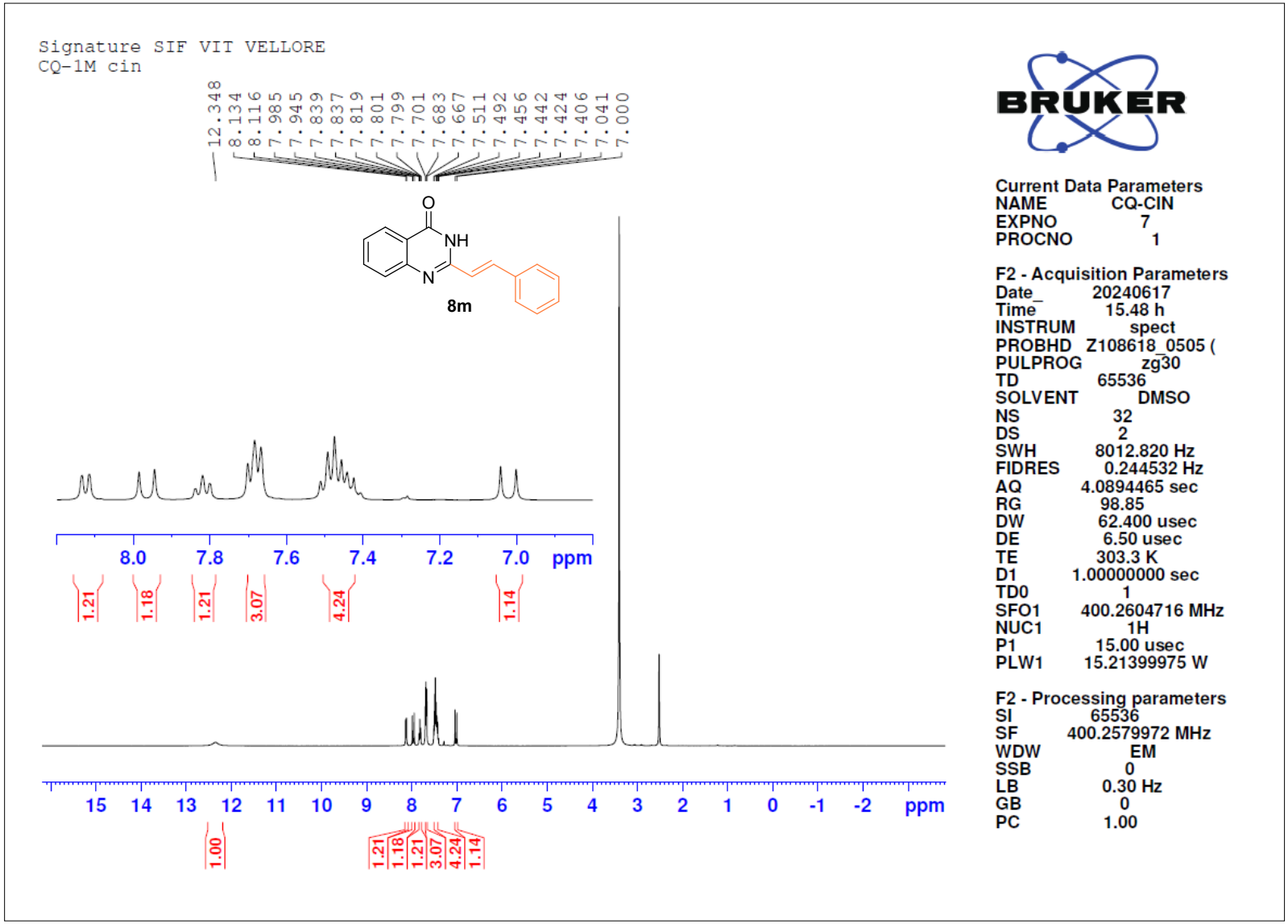

Figure 45: ^{1}H NMR spectrum of the compound **8m**.

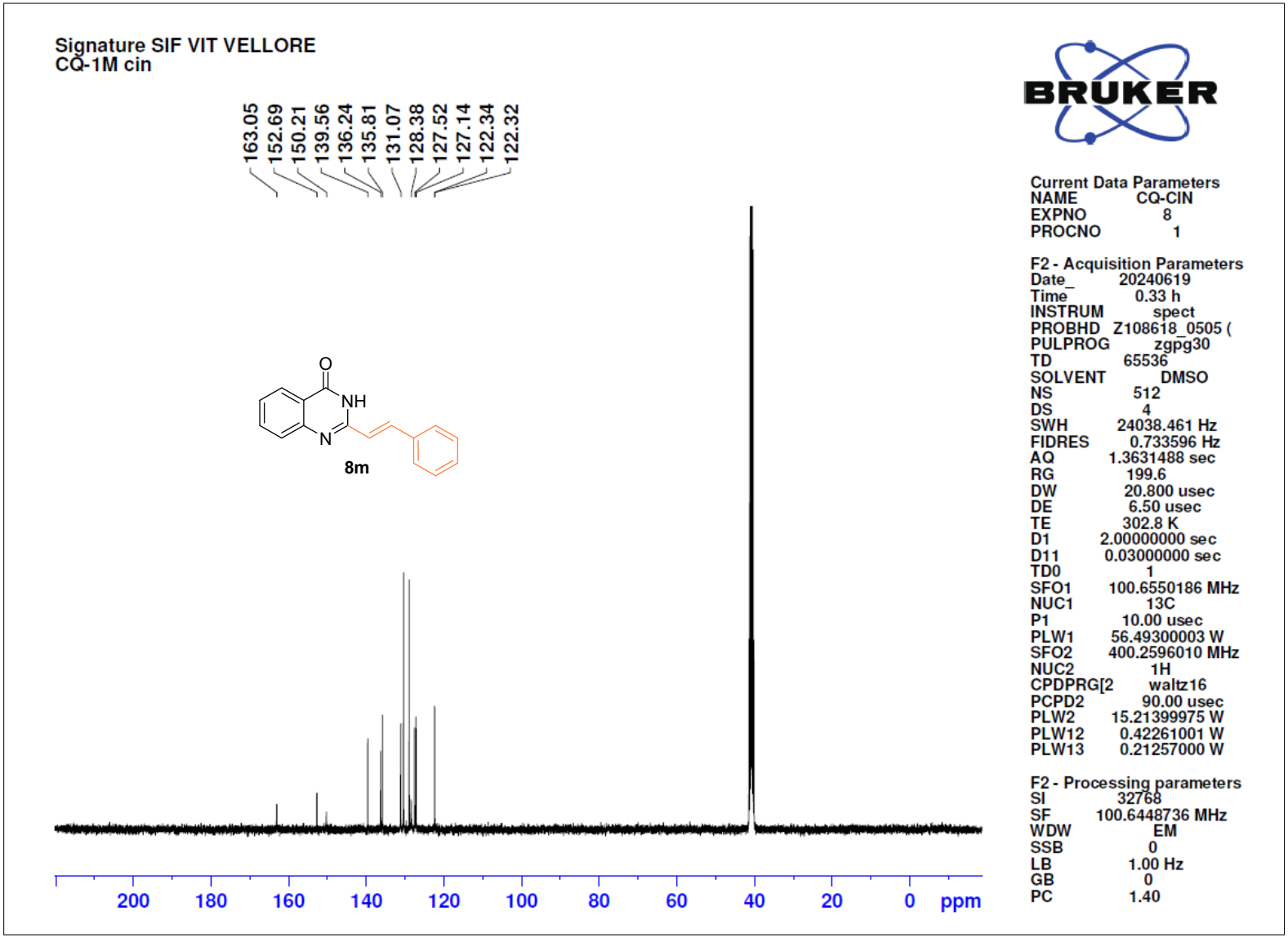

Figure 46: ^{13}C NMR spectrum of the compound **8m**.

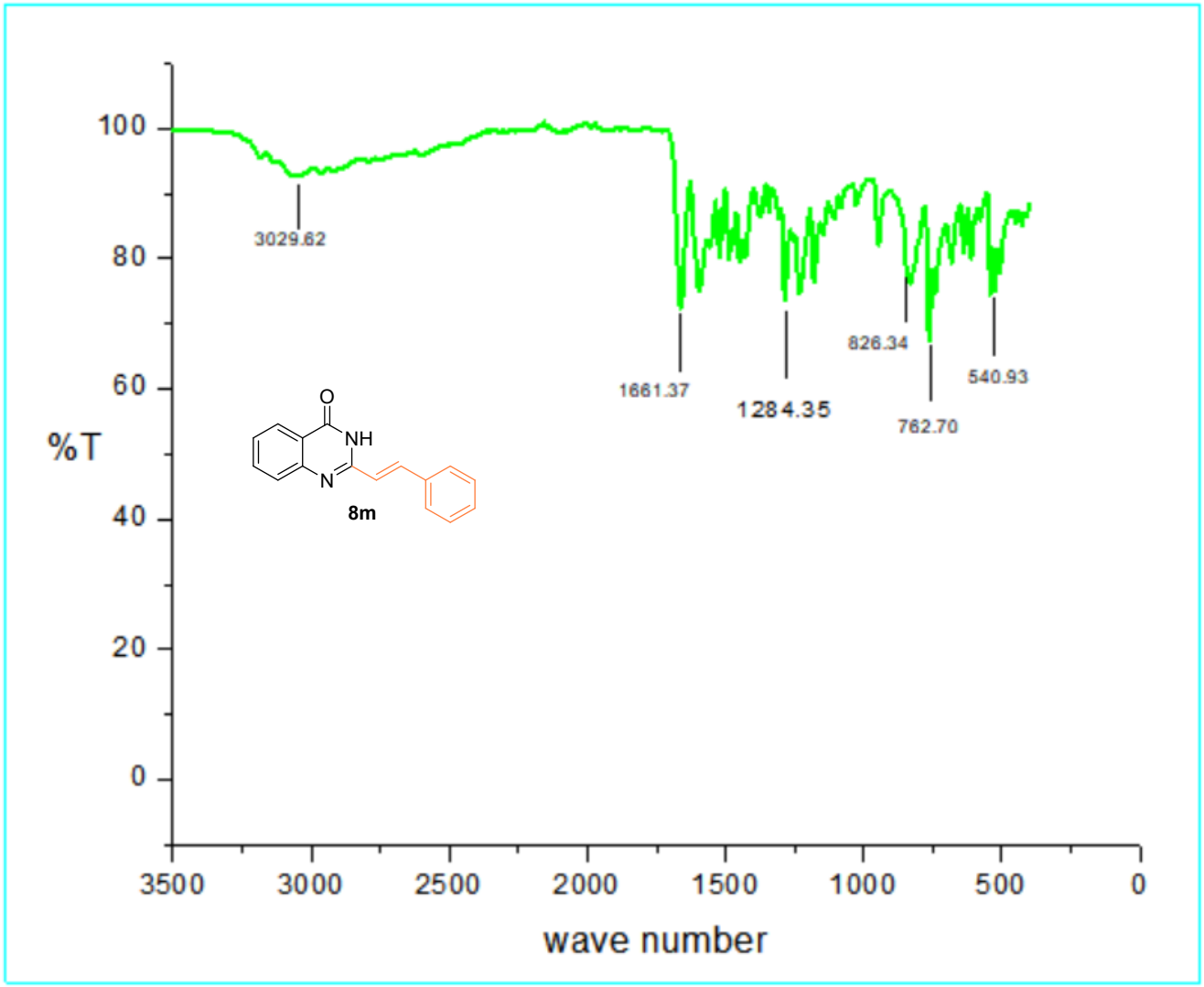

Figure 47: FT-IR spectrum of the compound **8m**.

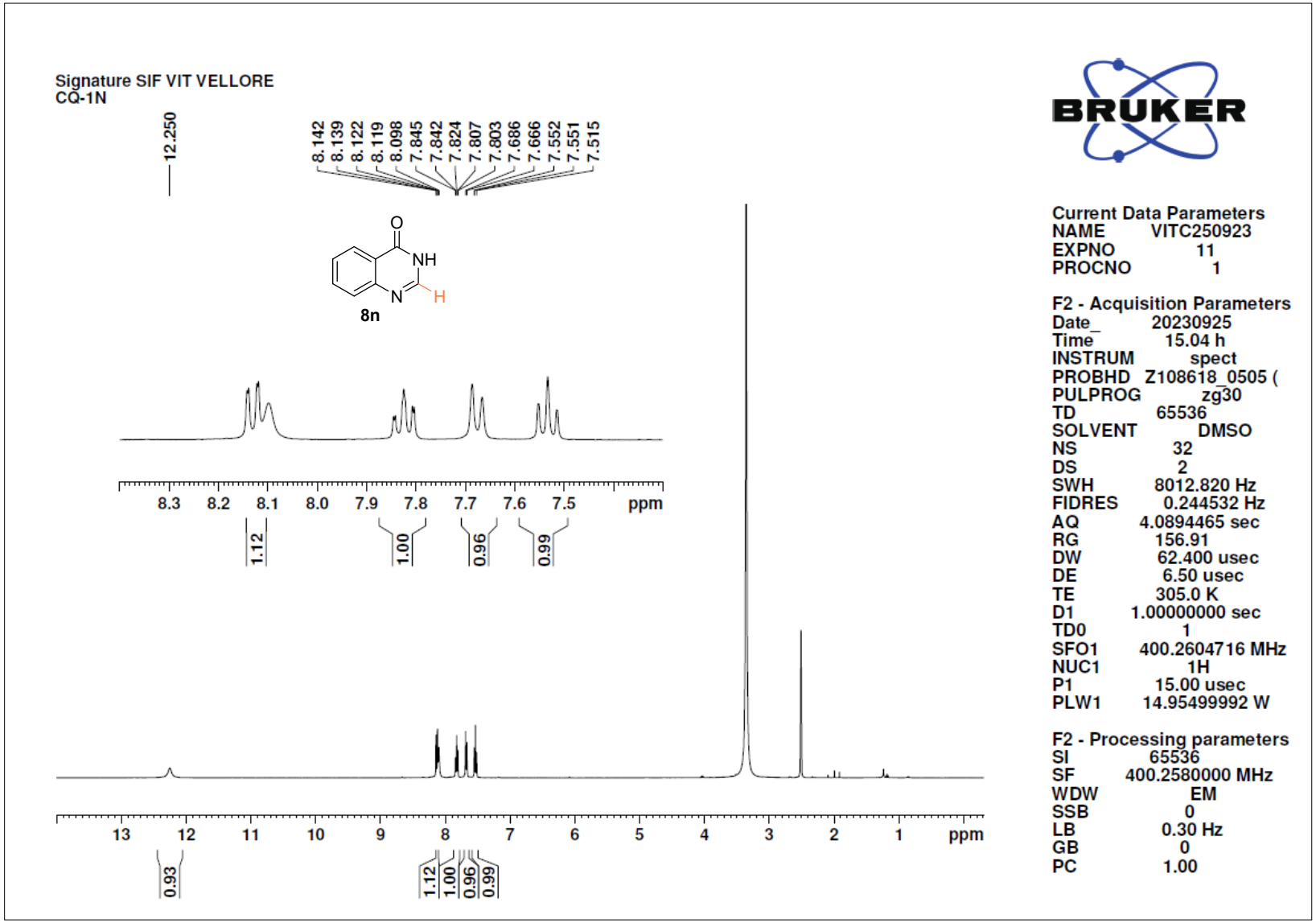

Figure 48: ^{1}H NMR spectrum of the compound **8n**.

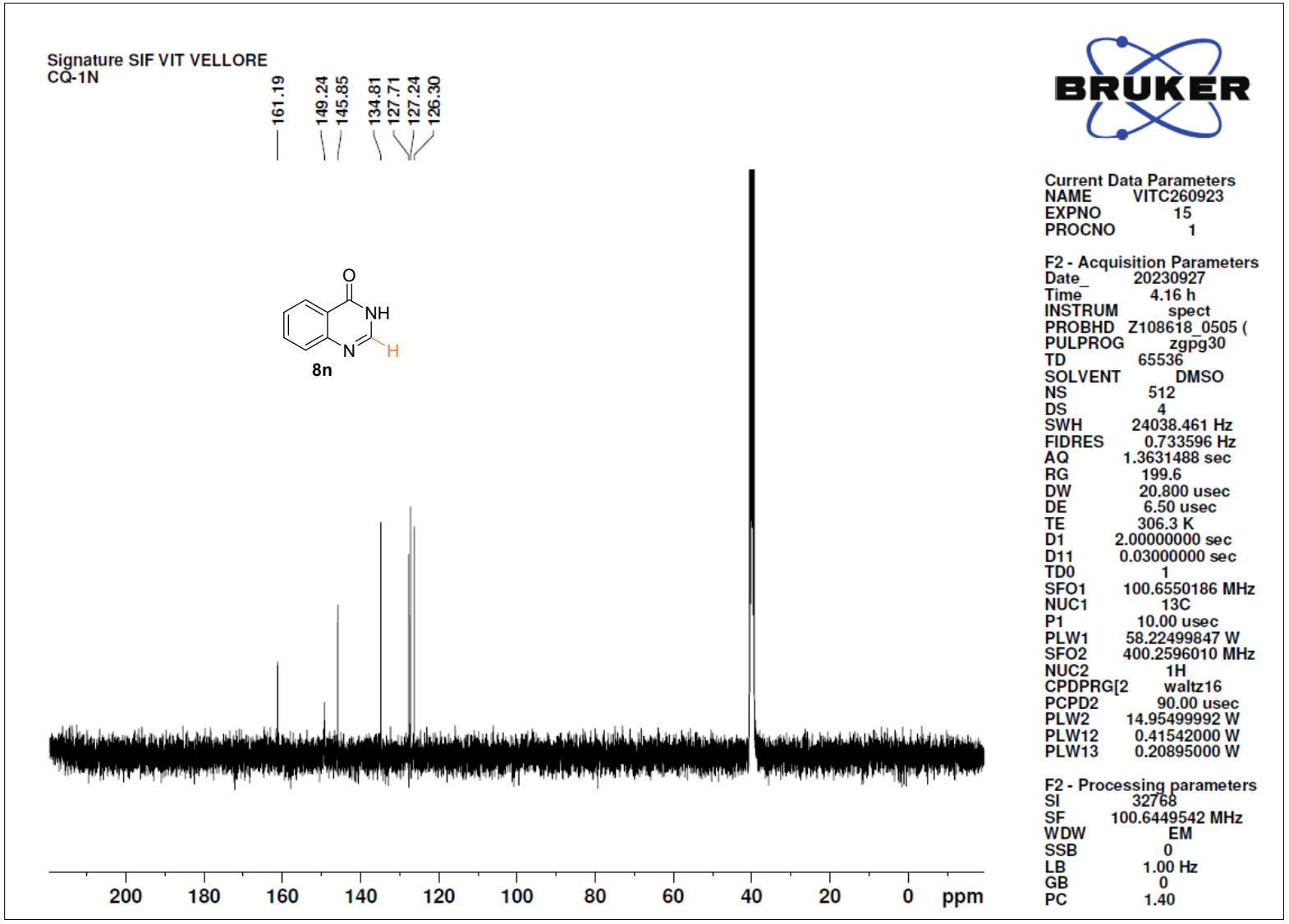

Figure 49: ^{13}C NMR spectrum of the compound **8n**.

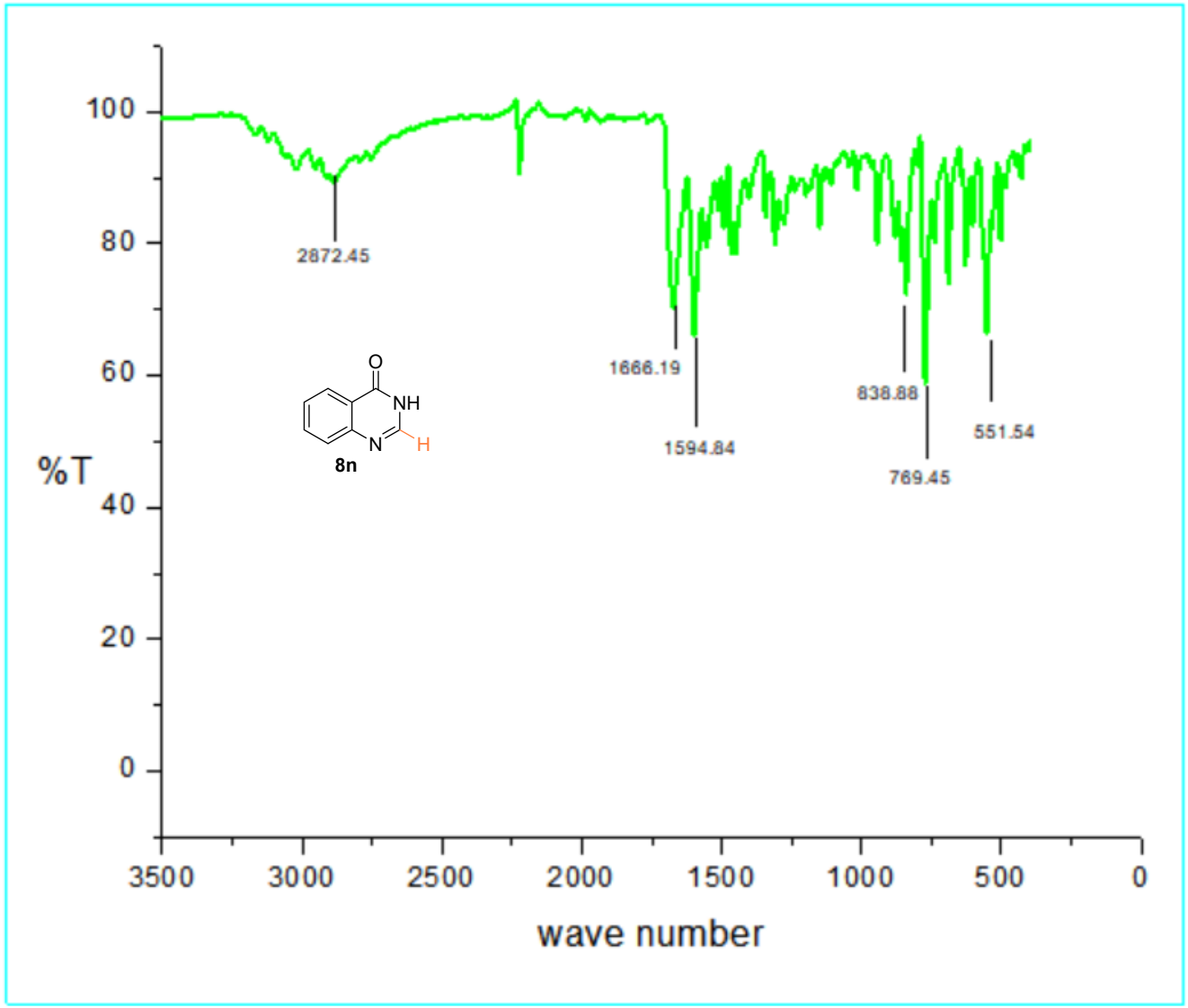

Figure 50: FT-IR spectrum of the compound **8n**.

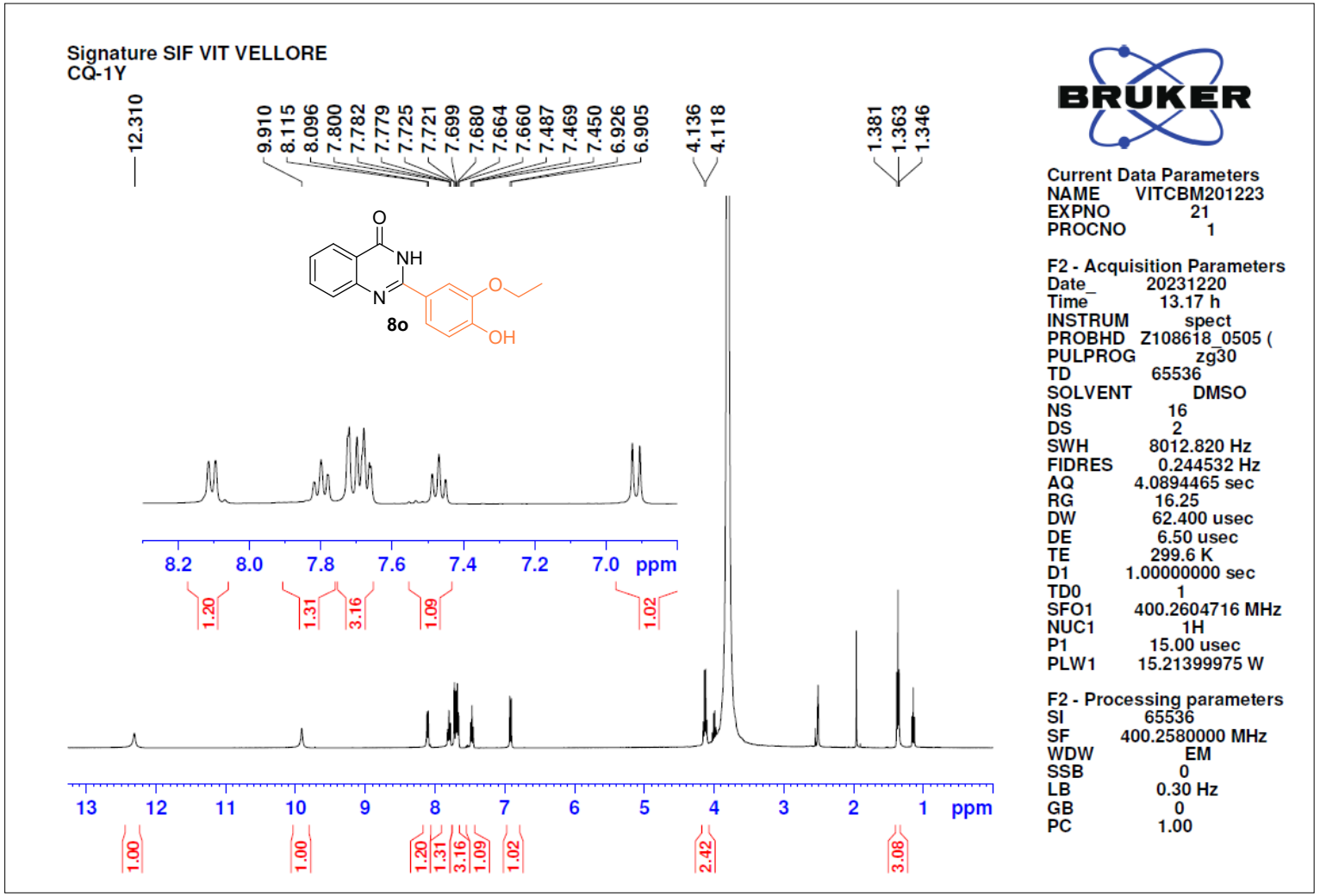

Figure 51: ^{1}H NMR spectrum of the compound **8o**.

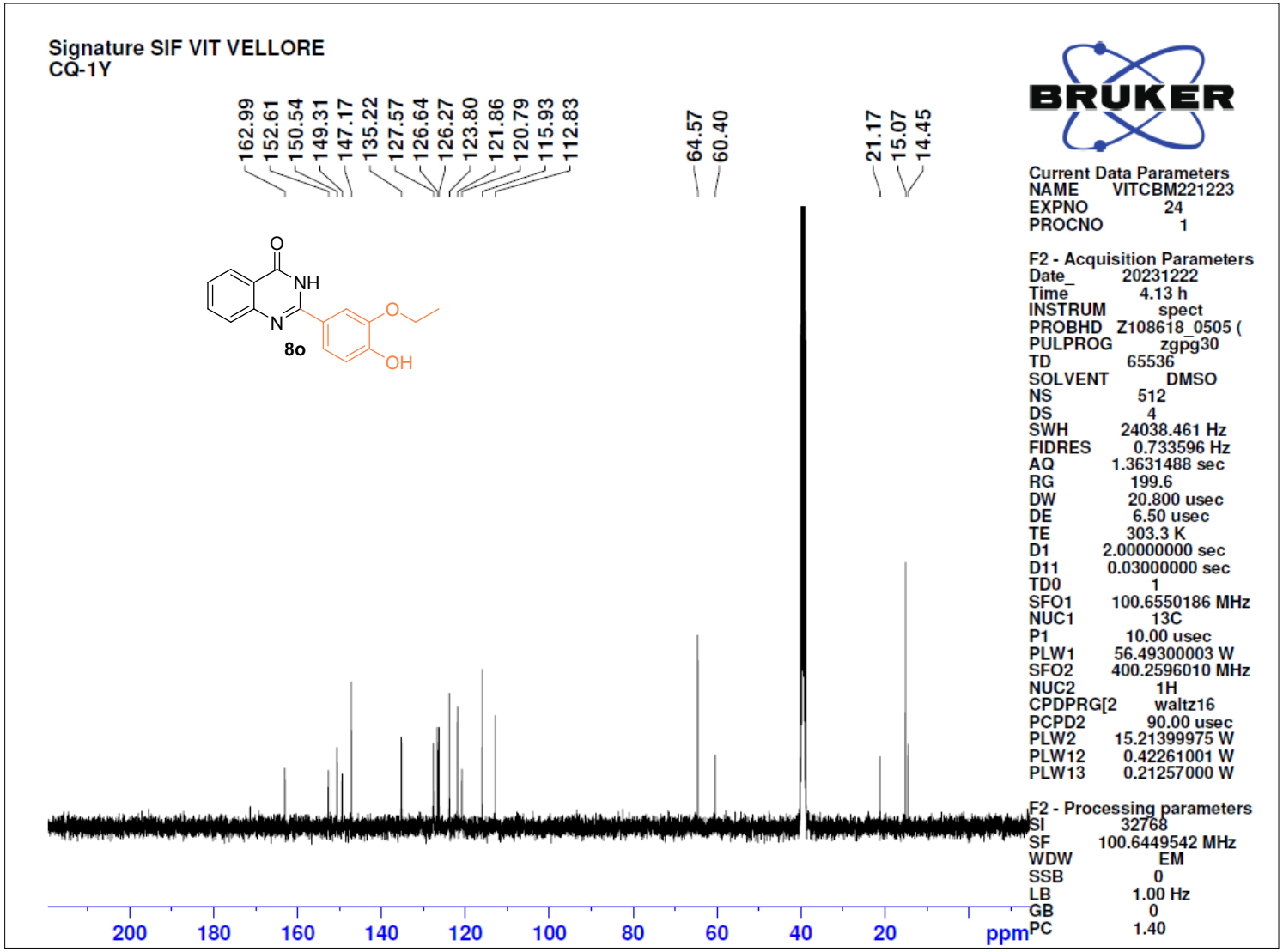

Figure 52: ^{13}C NMR spectrum of the compound **8o**.

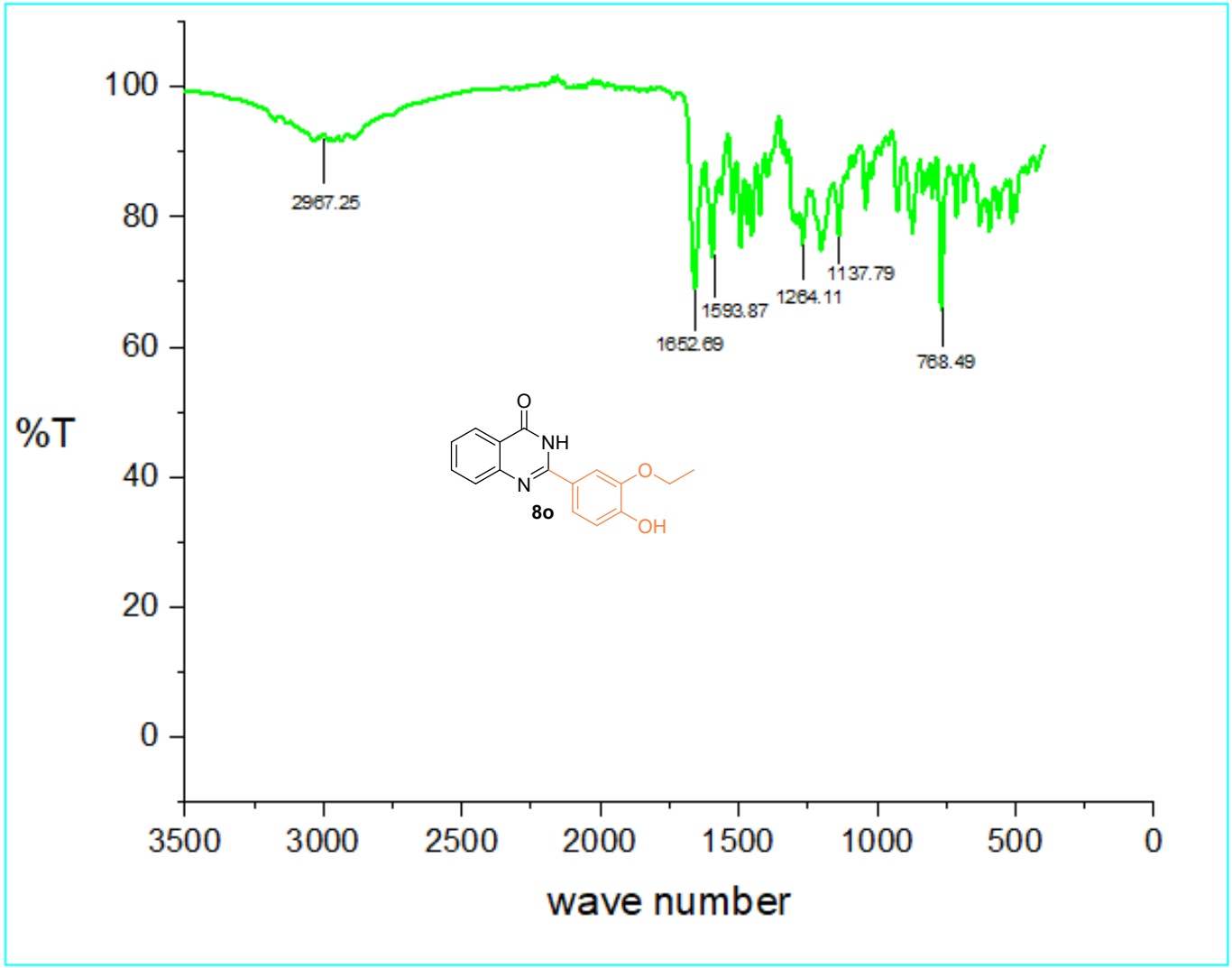

Figure 53: FT-IR spectrum of the compound **8o**.

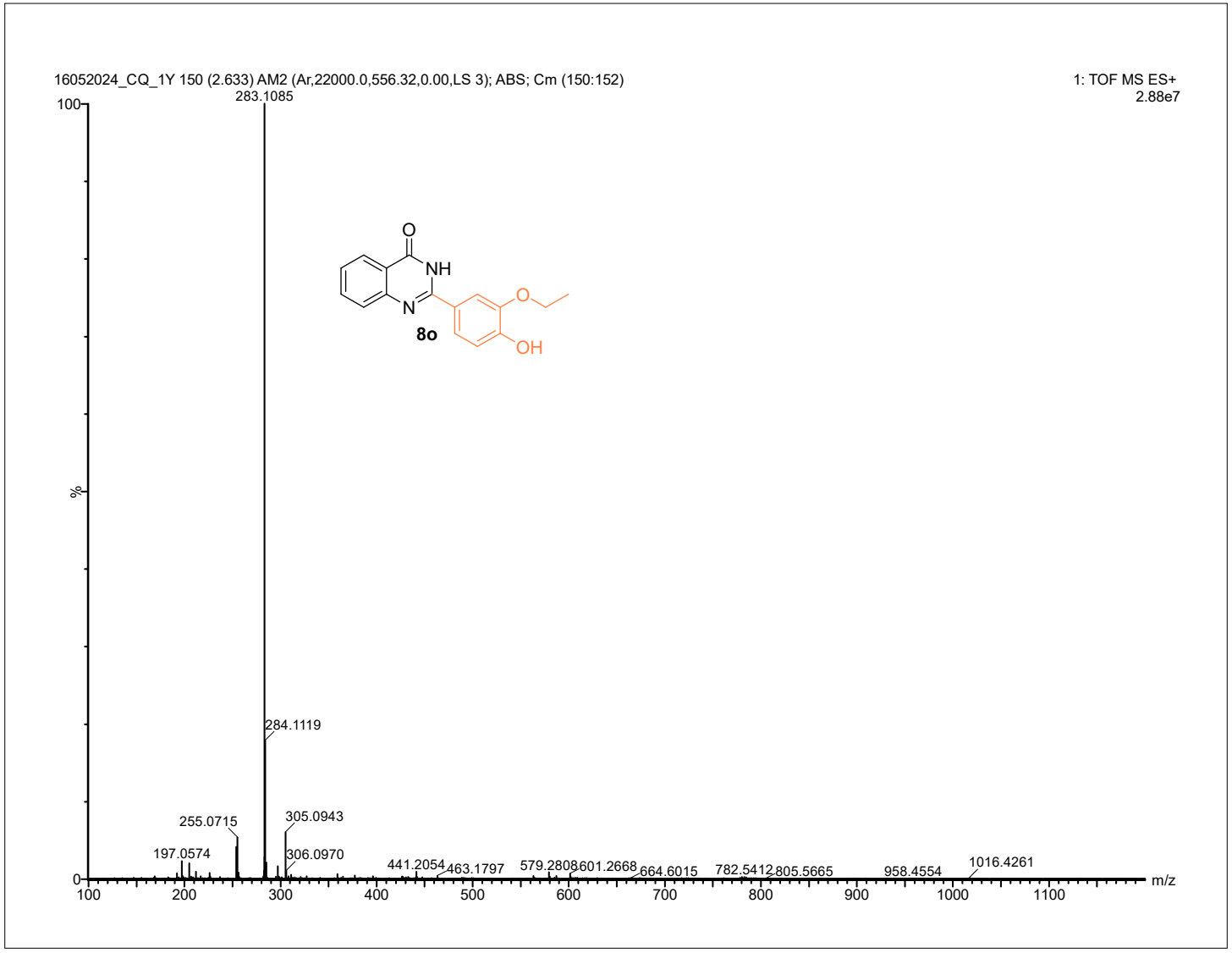

Figure 54: HRMS of the compound **8o**.

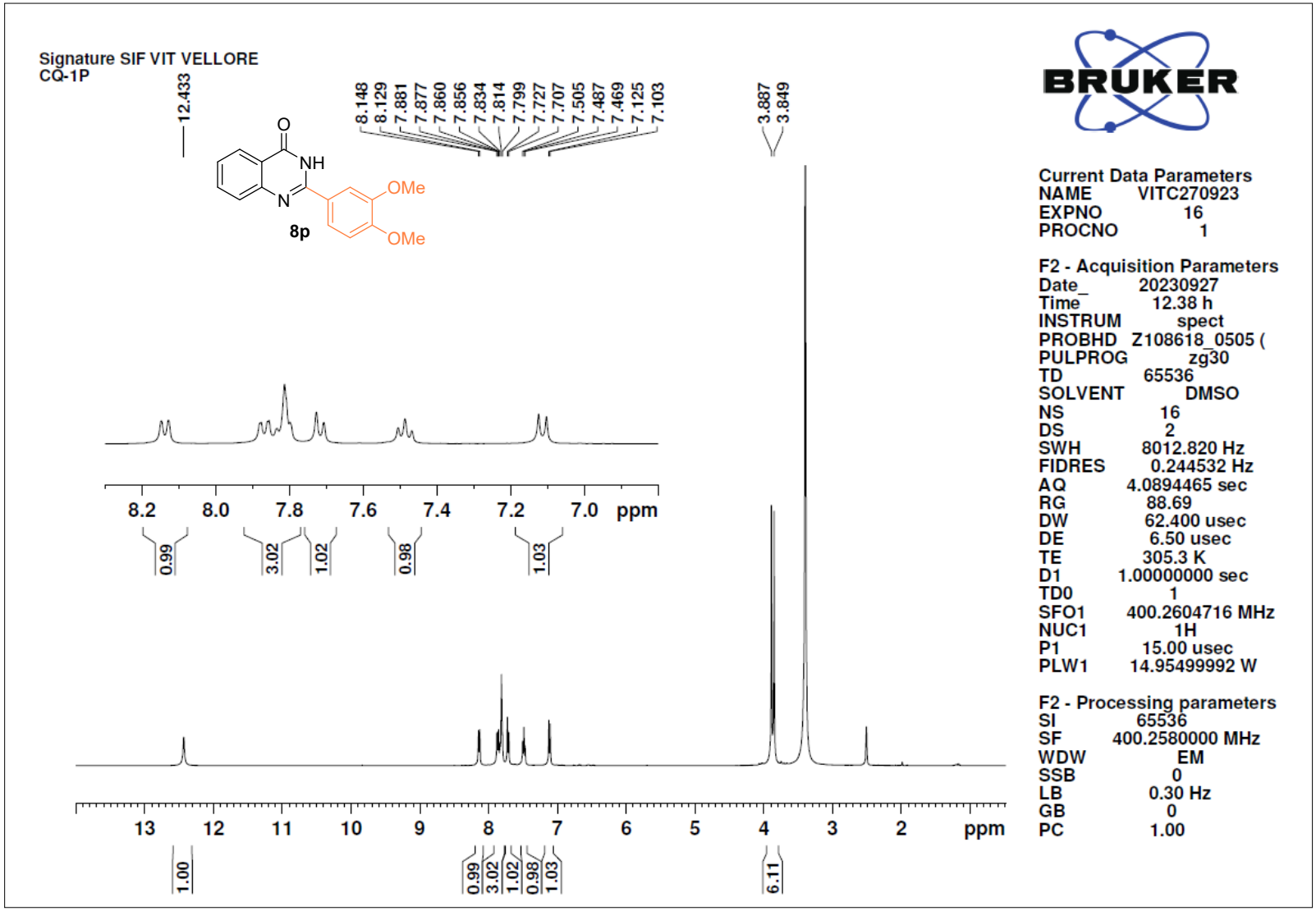

Figure 55: ^{1}H NMR spectrum of the compound **8p**.

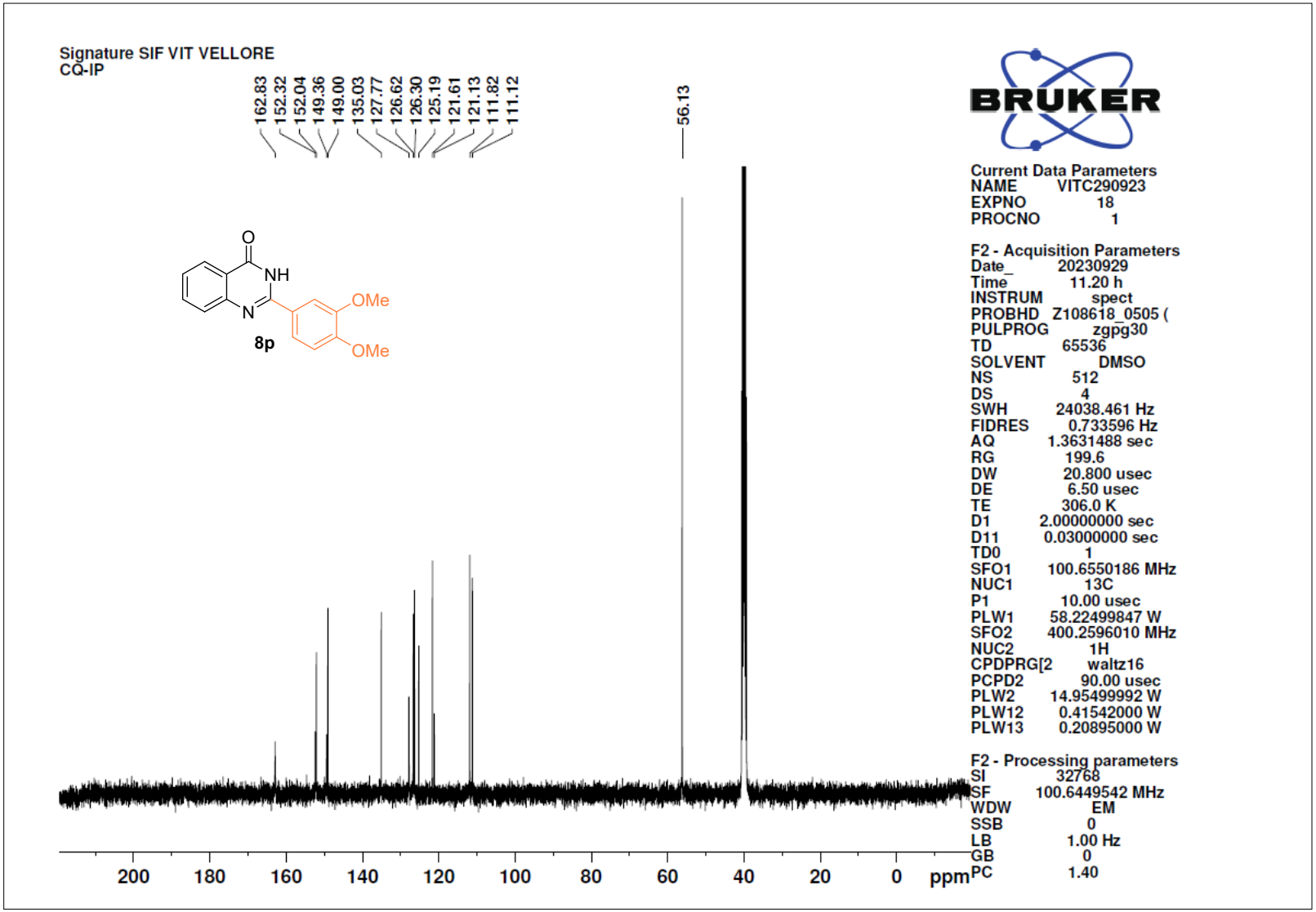

Figure 56: ^{13}C NMR spectrum of the compound **8p**.

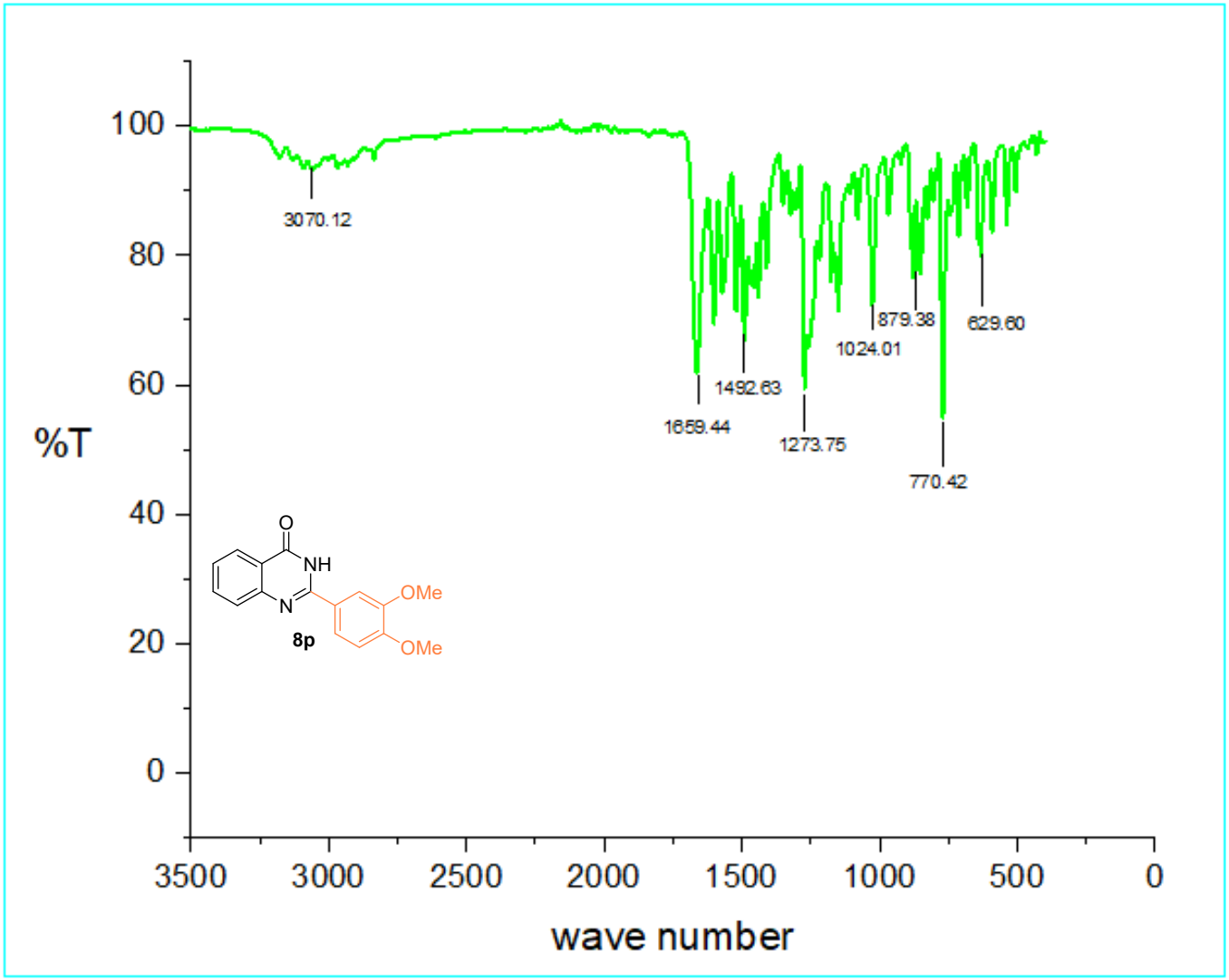

Figure 57: FT-IR spectrum of the compound **8p**.

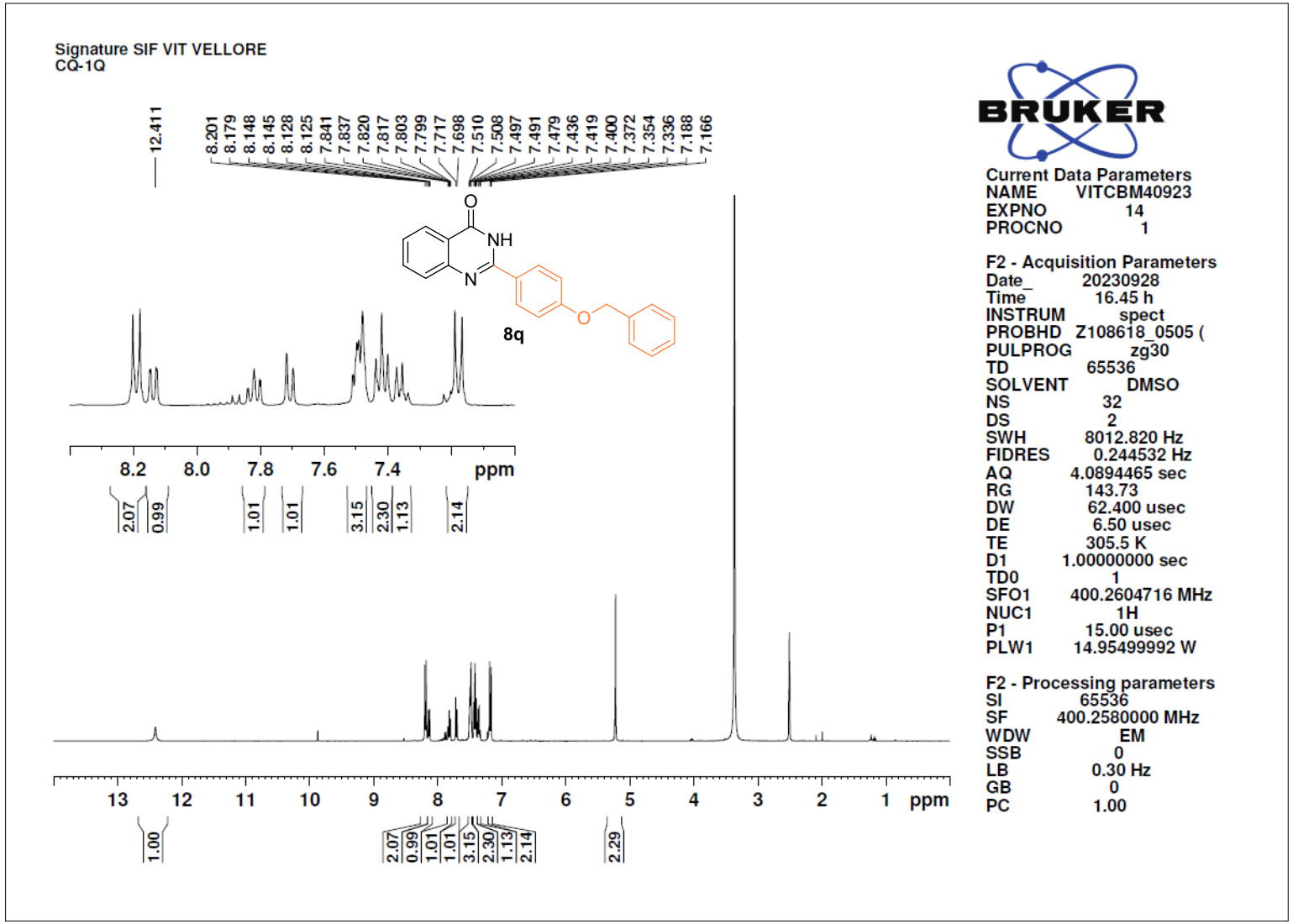

Figure 58: ^{1}H NMR spectrum of the compound **8q**.

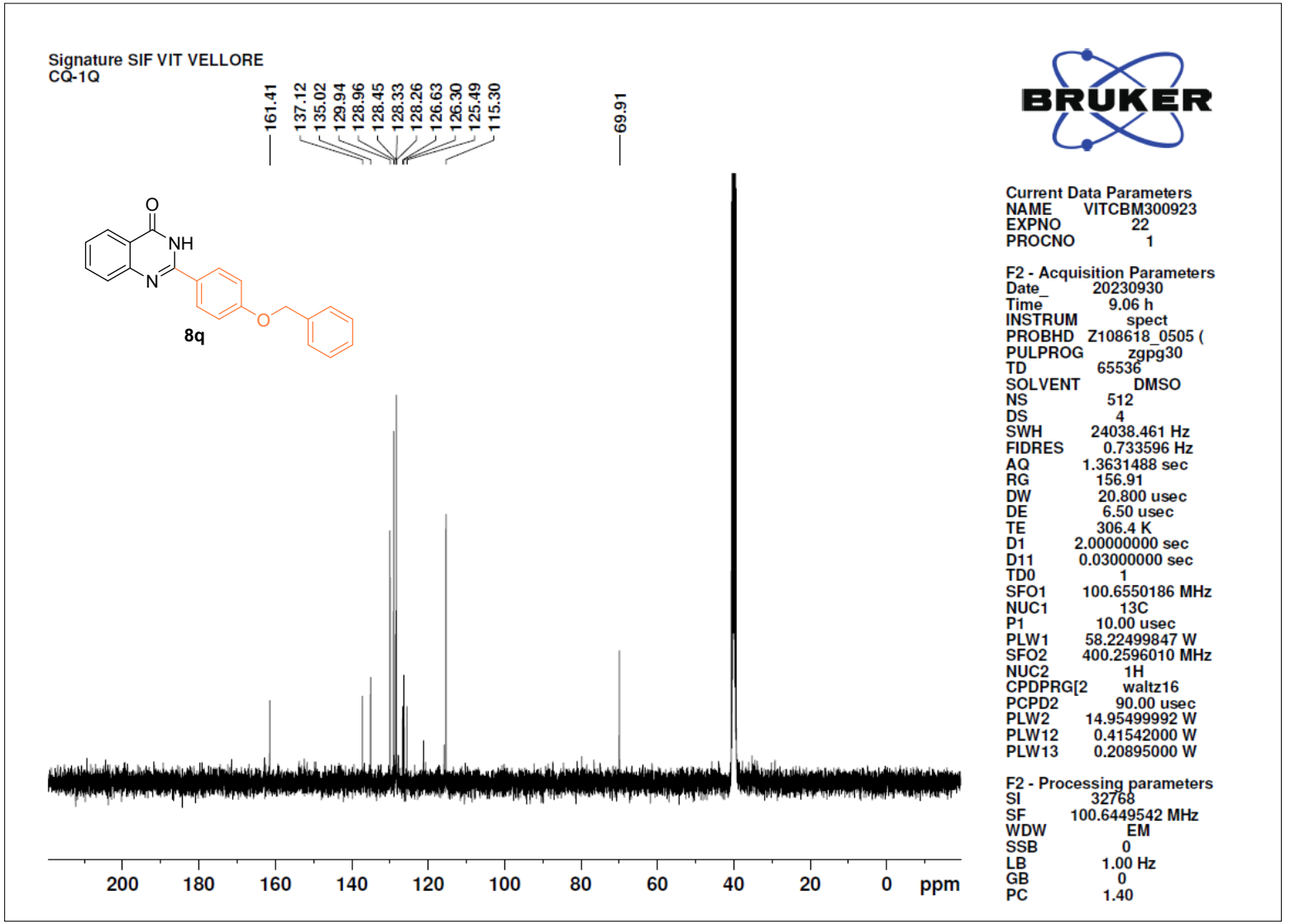

Figure 59: ^{13}C NMR spectrum of the compound **8q**.

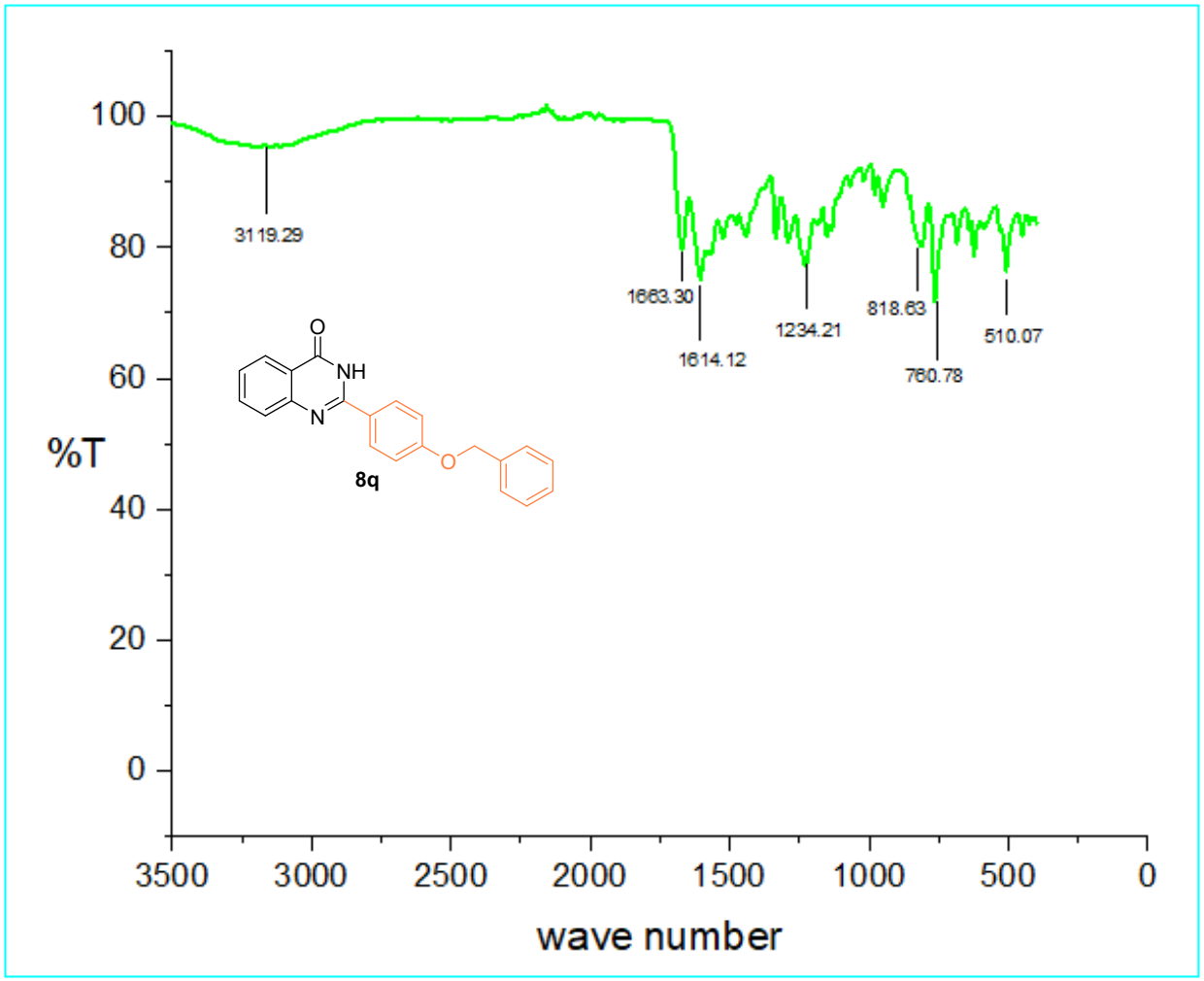

Figure 60: FT-IR spectrum of the compound **8q**.

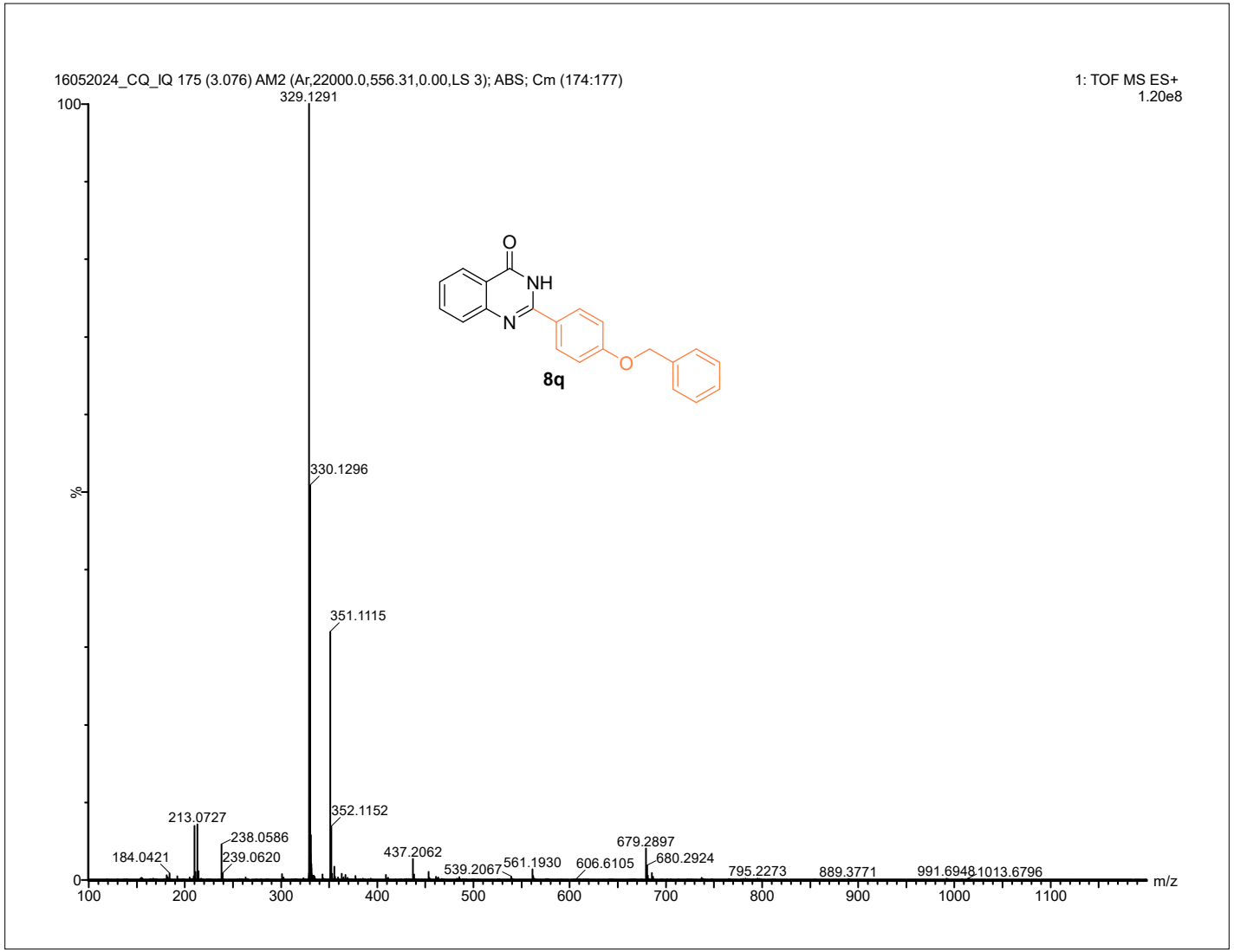

Figure 61: HRMS spectrum of the compound **8q**.

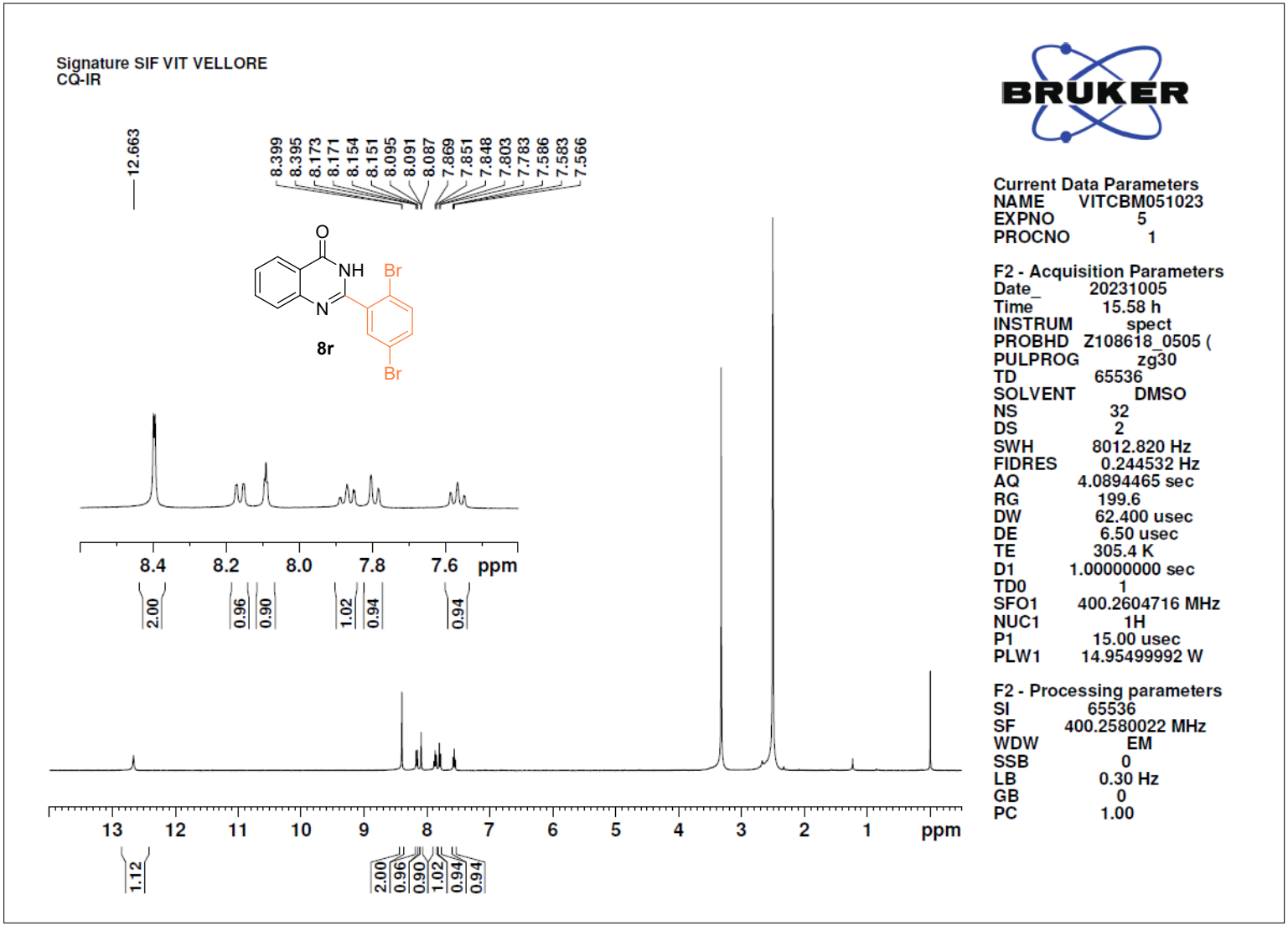

Figure 62: ^{1}H NMR spectrum of the compound **8r**.

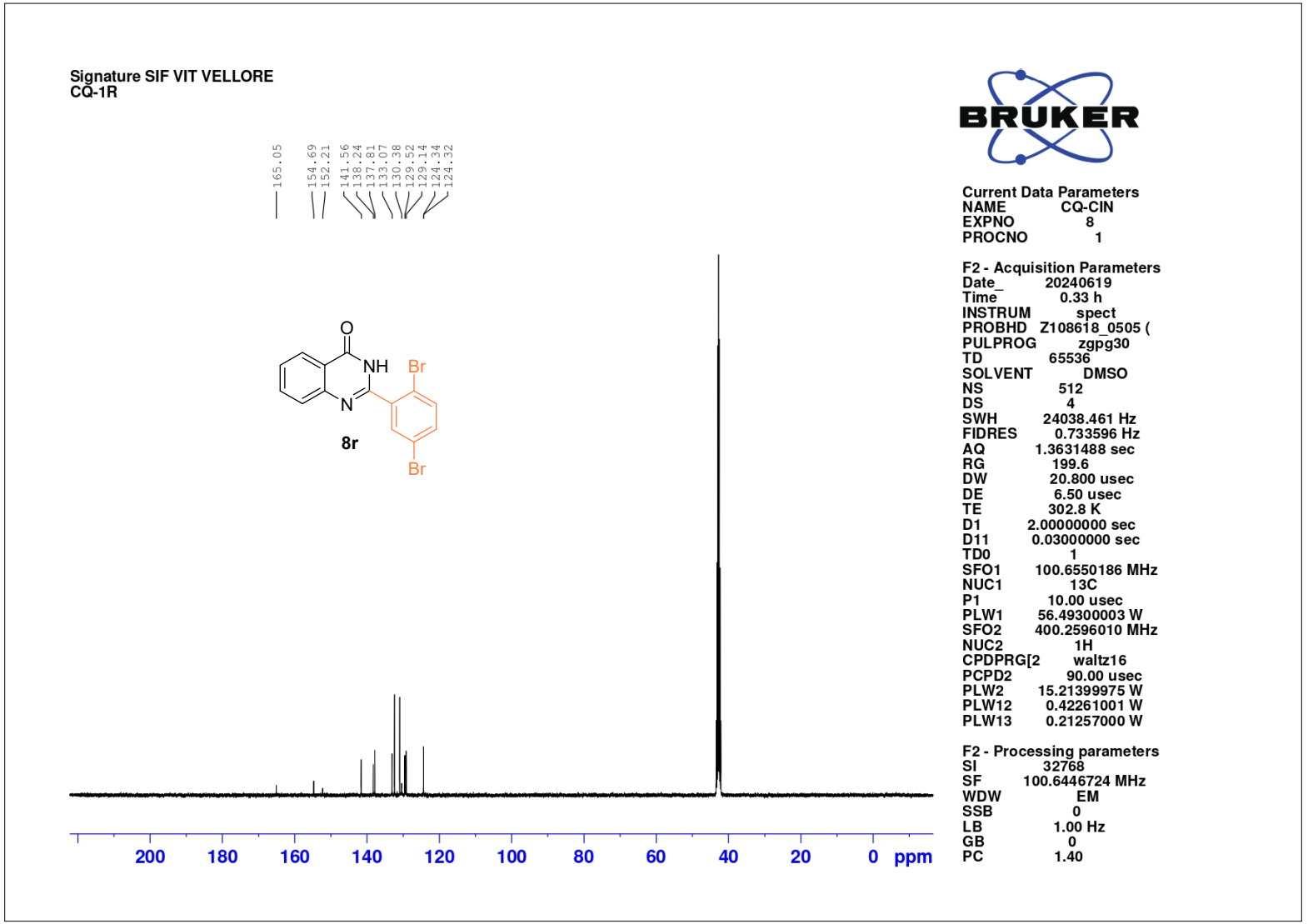

Figure 63: ^{13}C NMR spectrum of the compound **8r**.

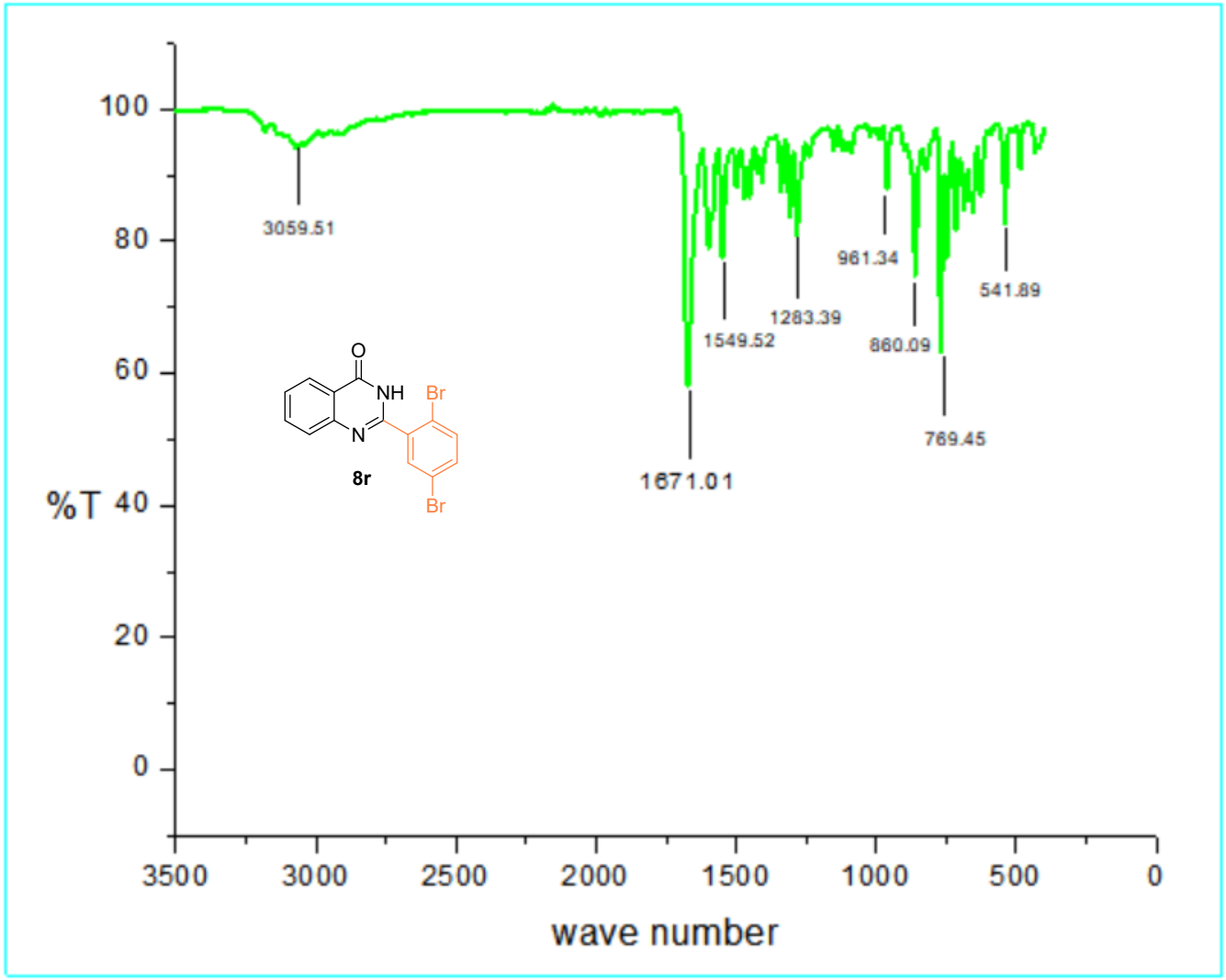

Figure 64: FT-IR spectrum of the compound **8r**.

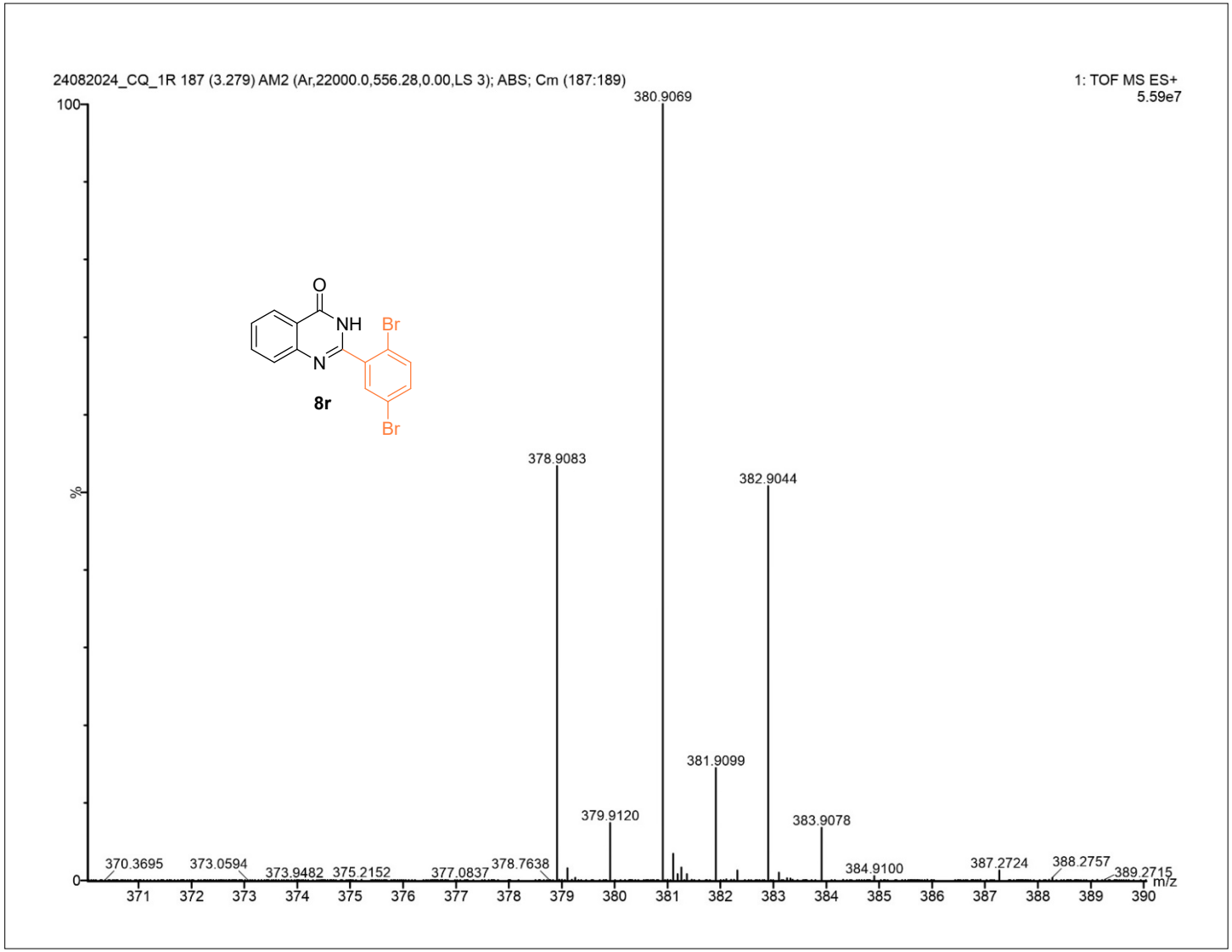

Figure 65: HRMS of the compound **8r**.

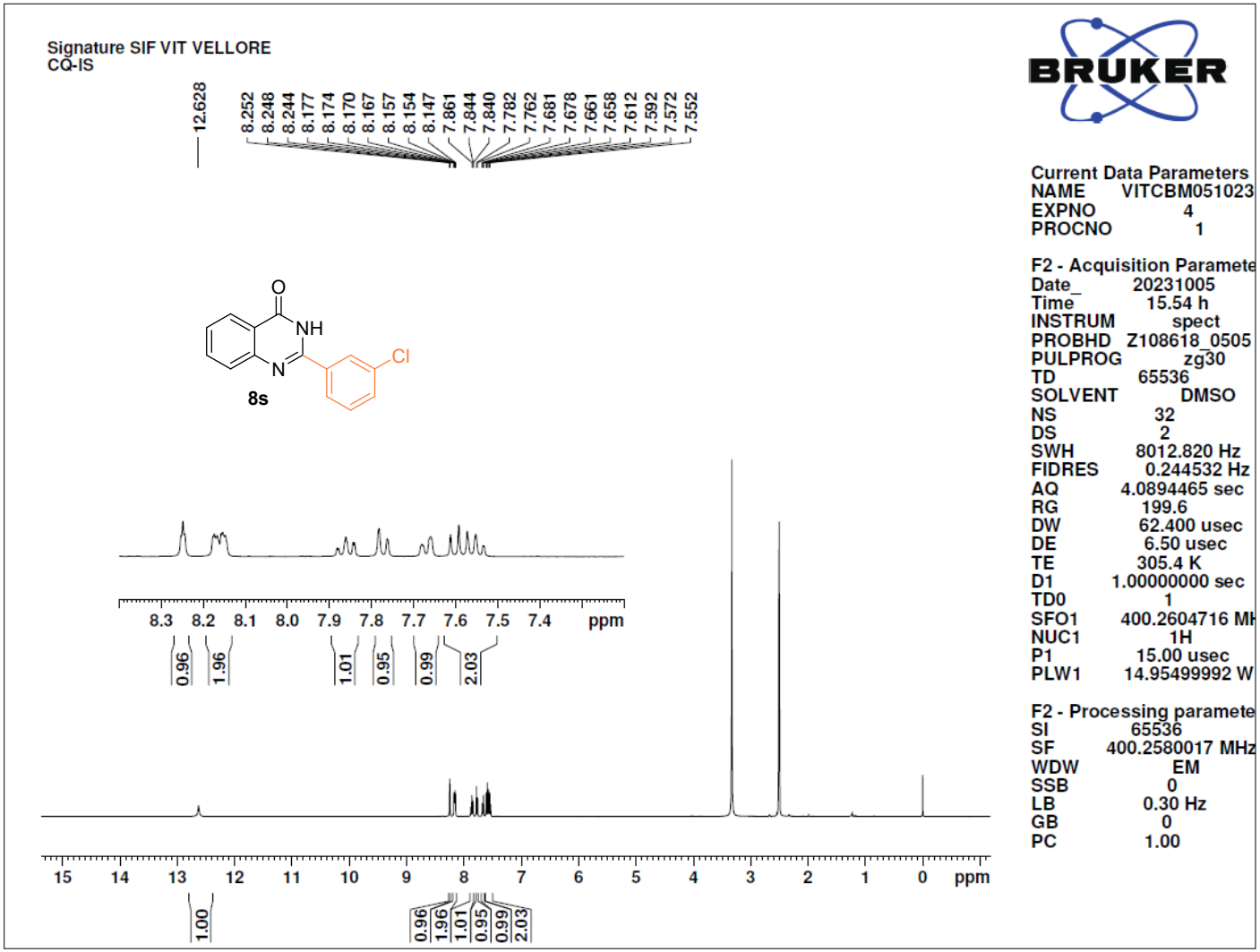

Figure 66: ^{1}H NMR spectrum of the compound **8s**.

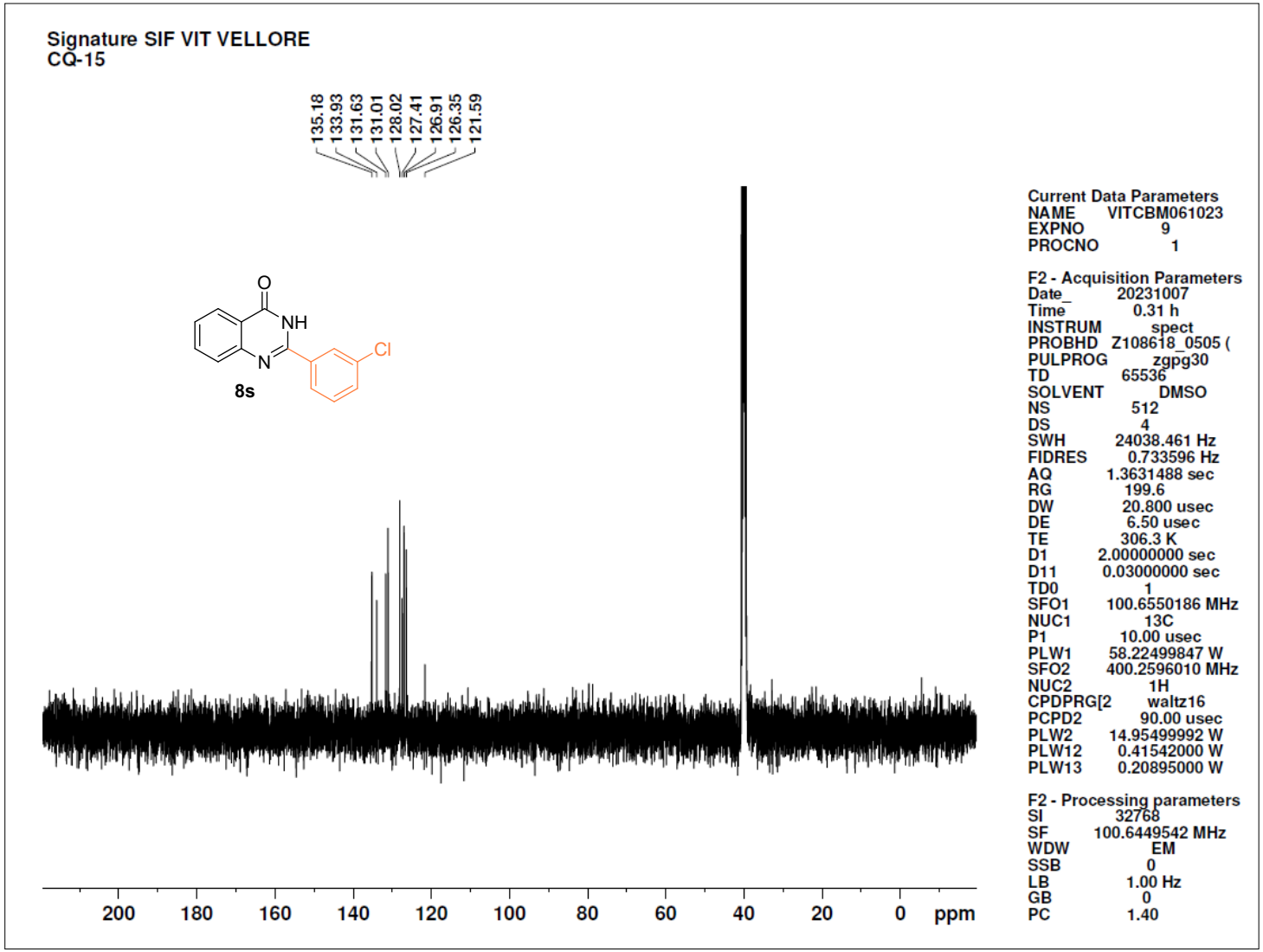

Figure 67: ^{13}C NMR spectrum of the compound **8s**.

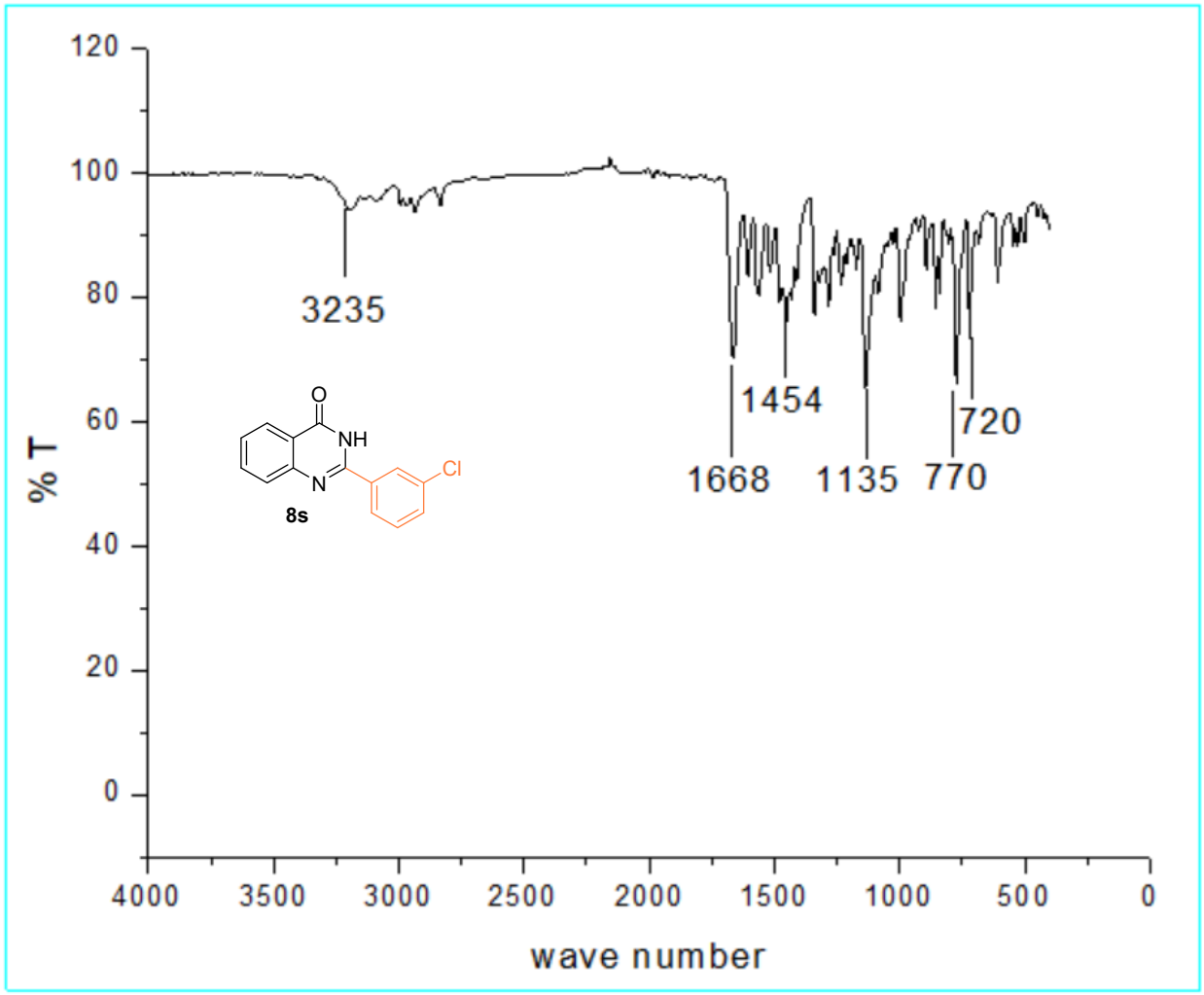

Figure 68: FT-IR spectrum of the compound **8s**.

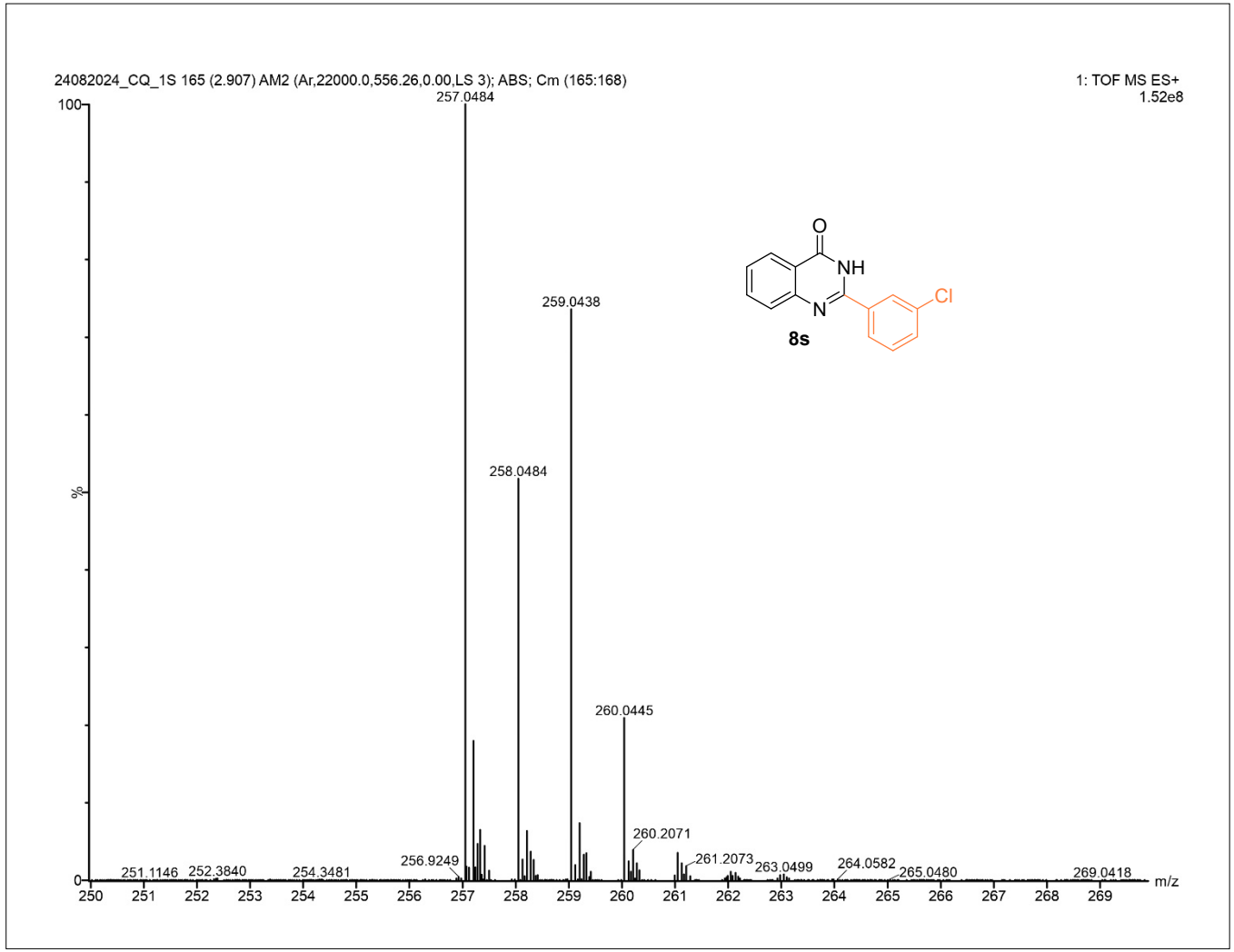

Figure 69: HRMS of the compound **8s**.

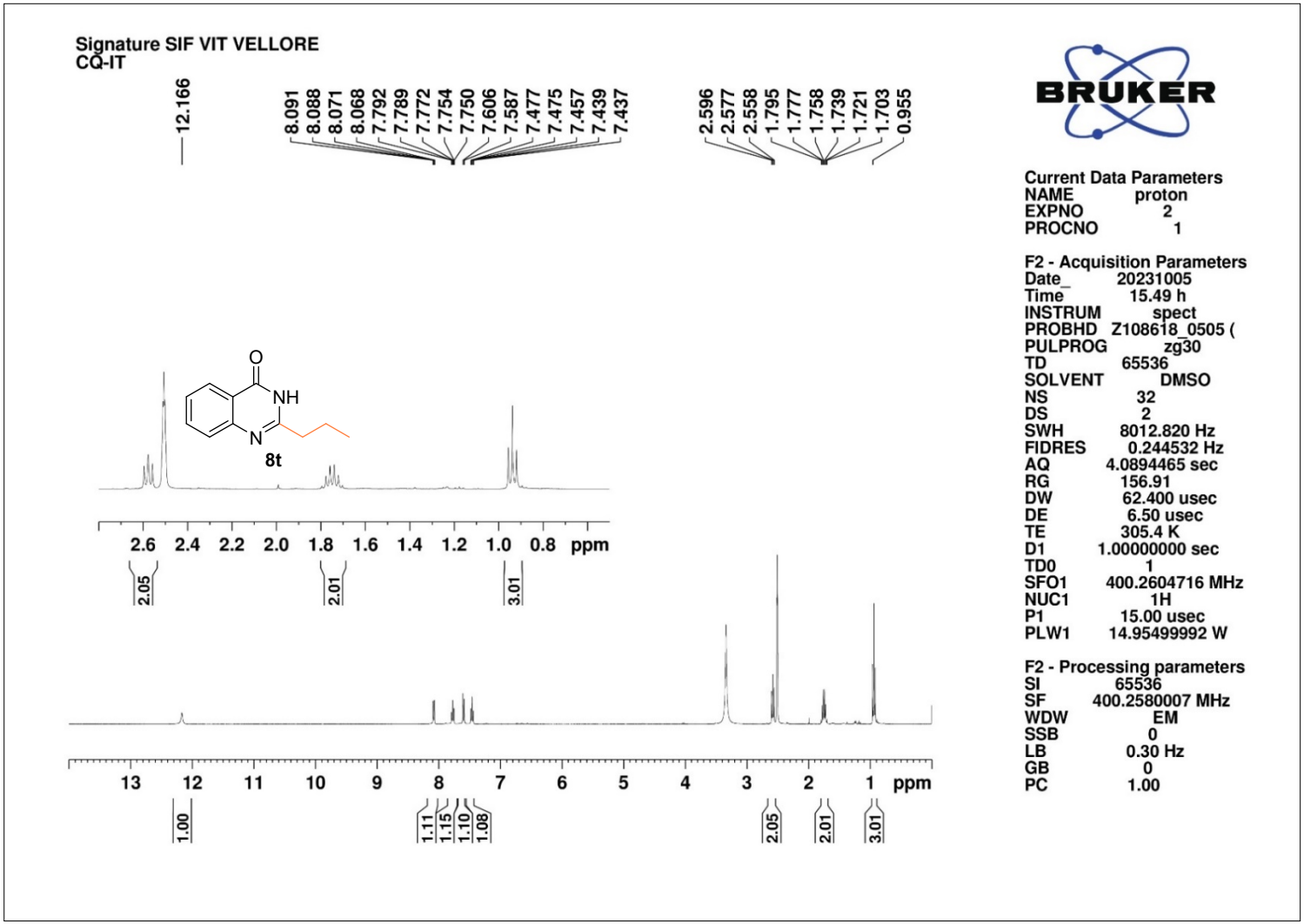

Figure 70: ^{1}H NMR spectrum of the compound **8t.**

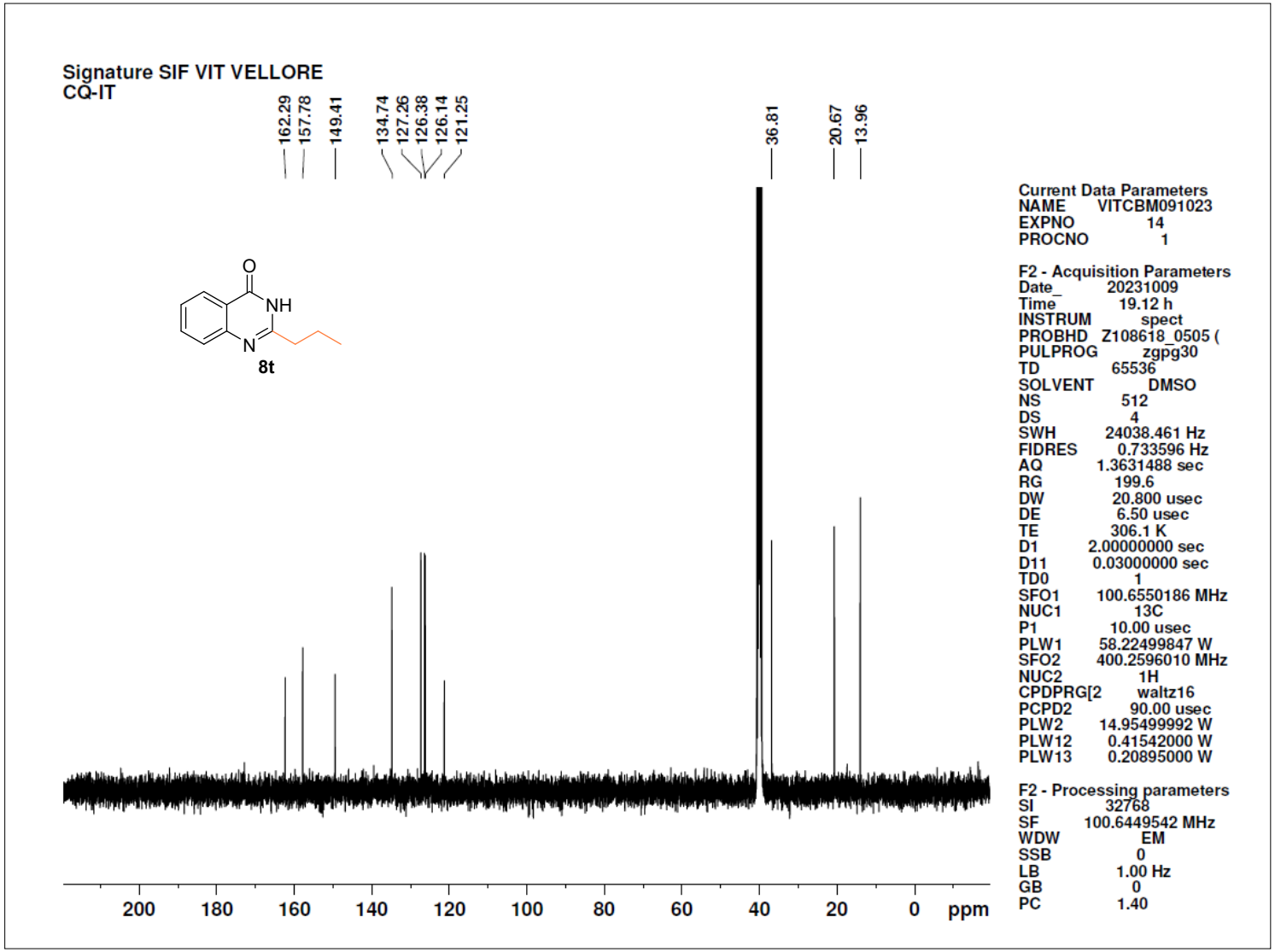

Figure 71: ^{13}C NMR spectrum of the compound **8t**.

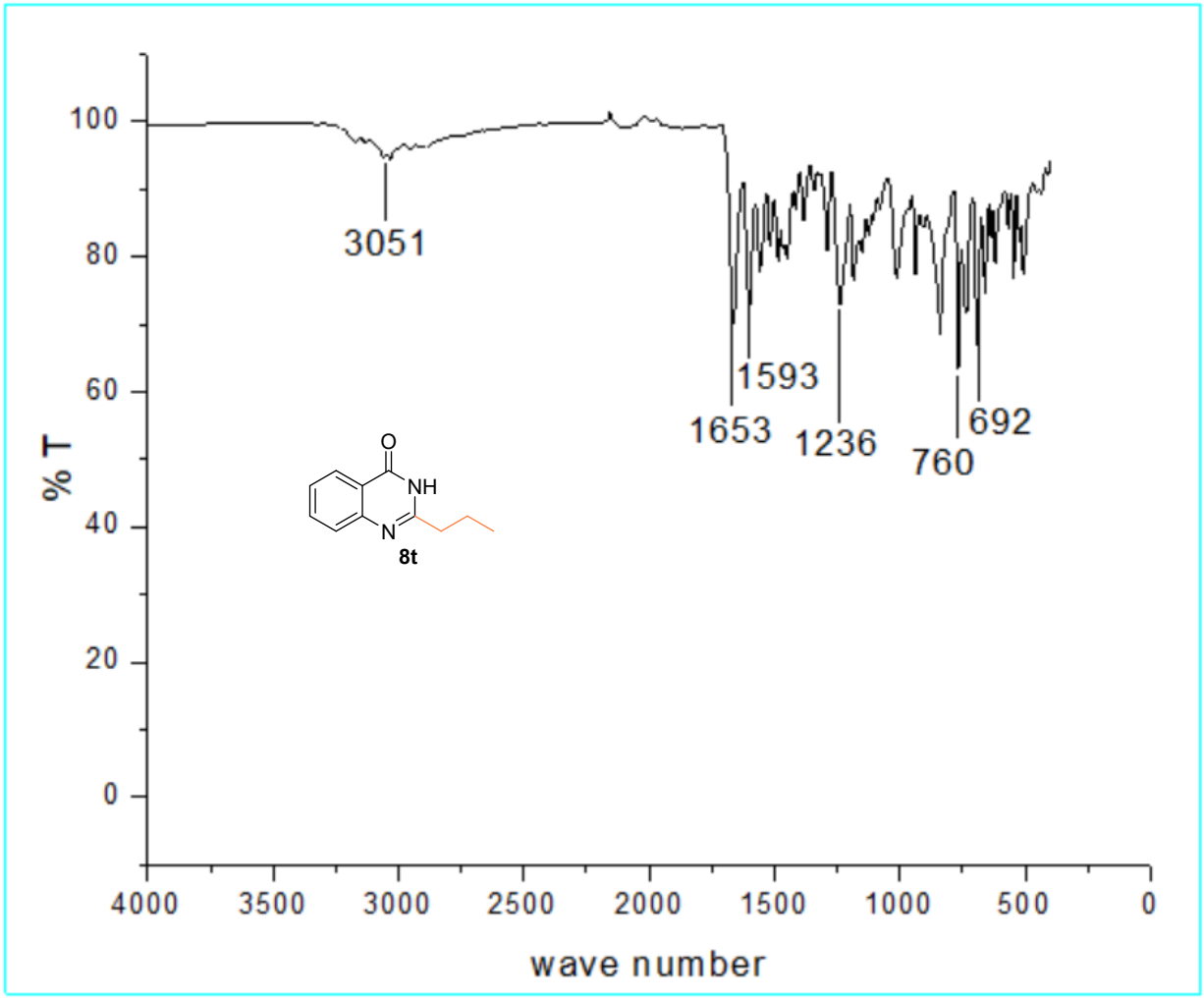

Figure 72: FT-IR spectrum of the compound **8t**.

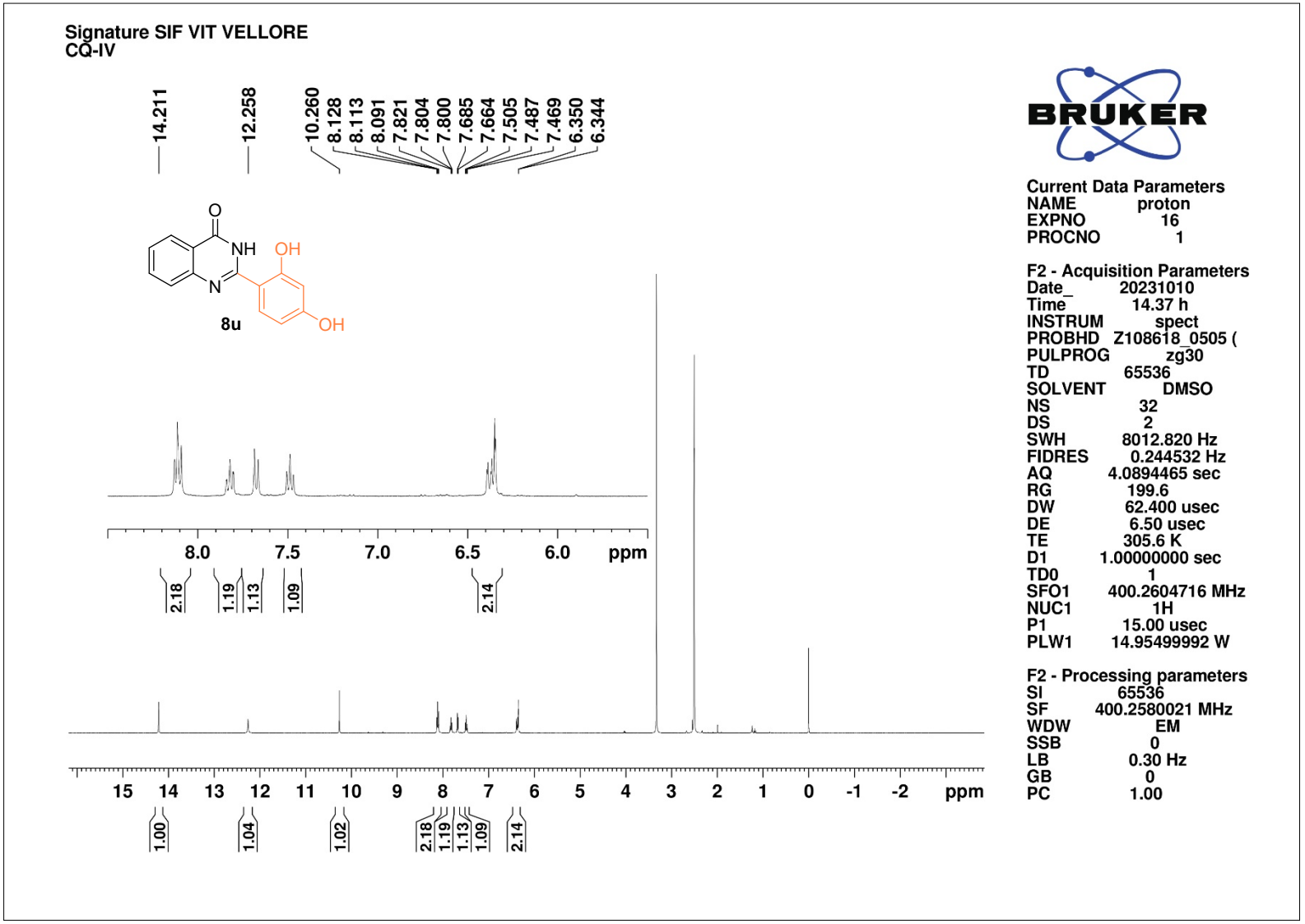

Figure 73: ^{1}H NMR spectrum of the compound **8u.**

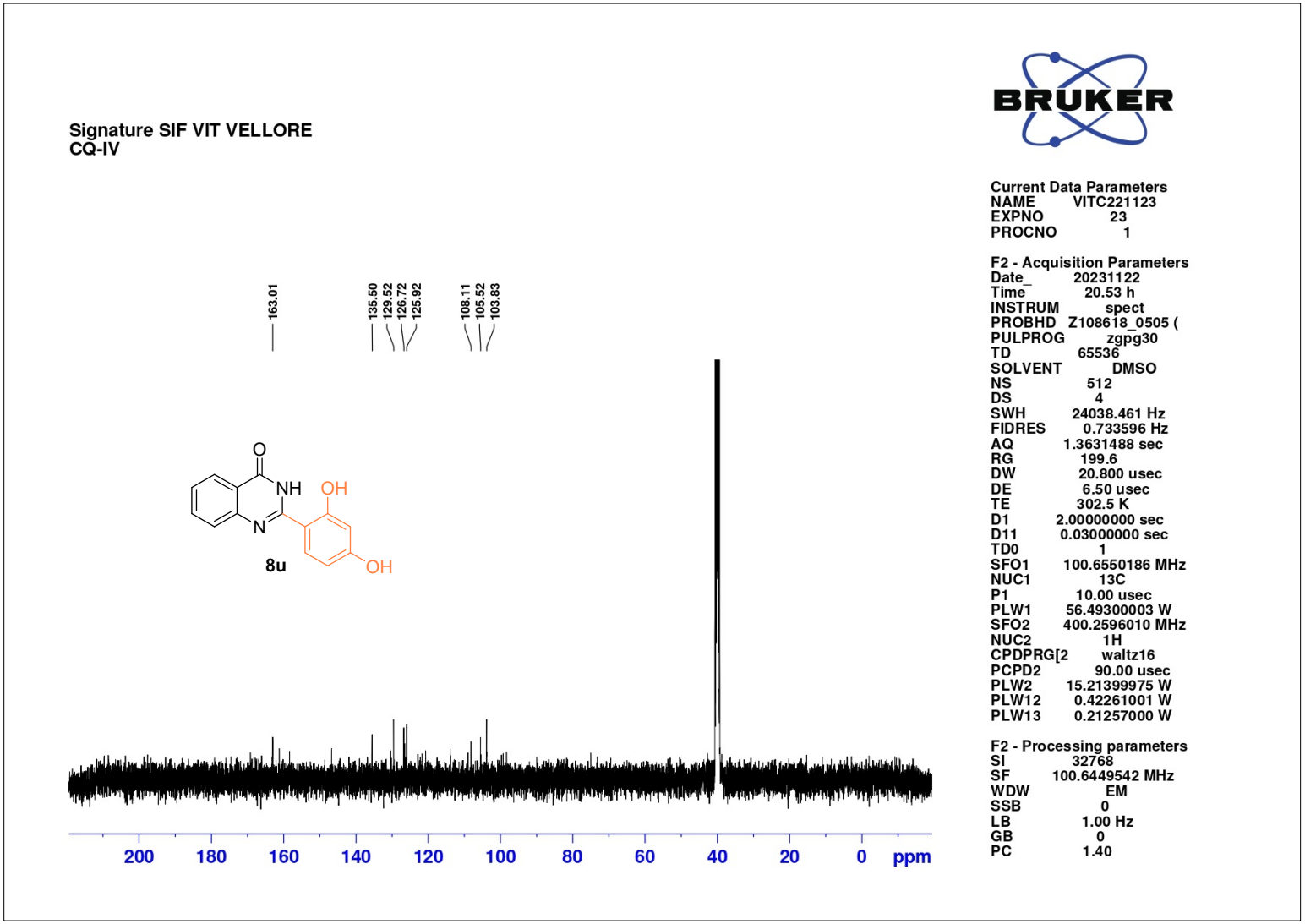

Figure 74: ^{13}C NMR spectrum of the compound **8u**.

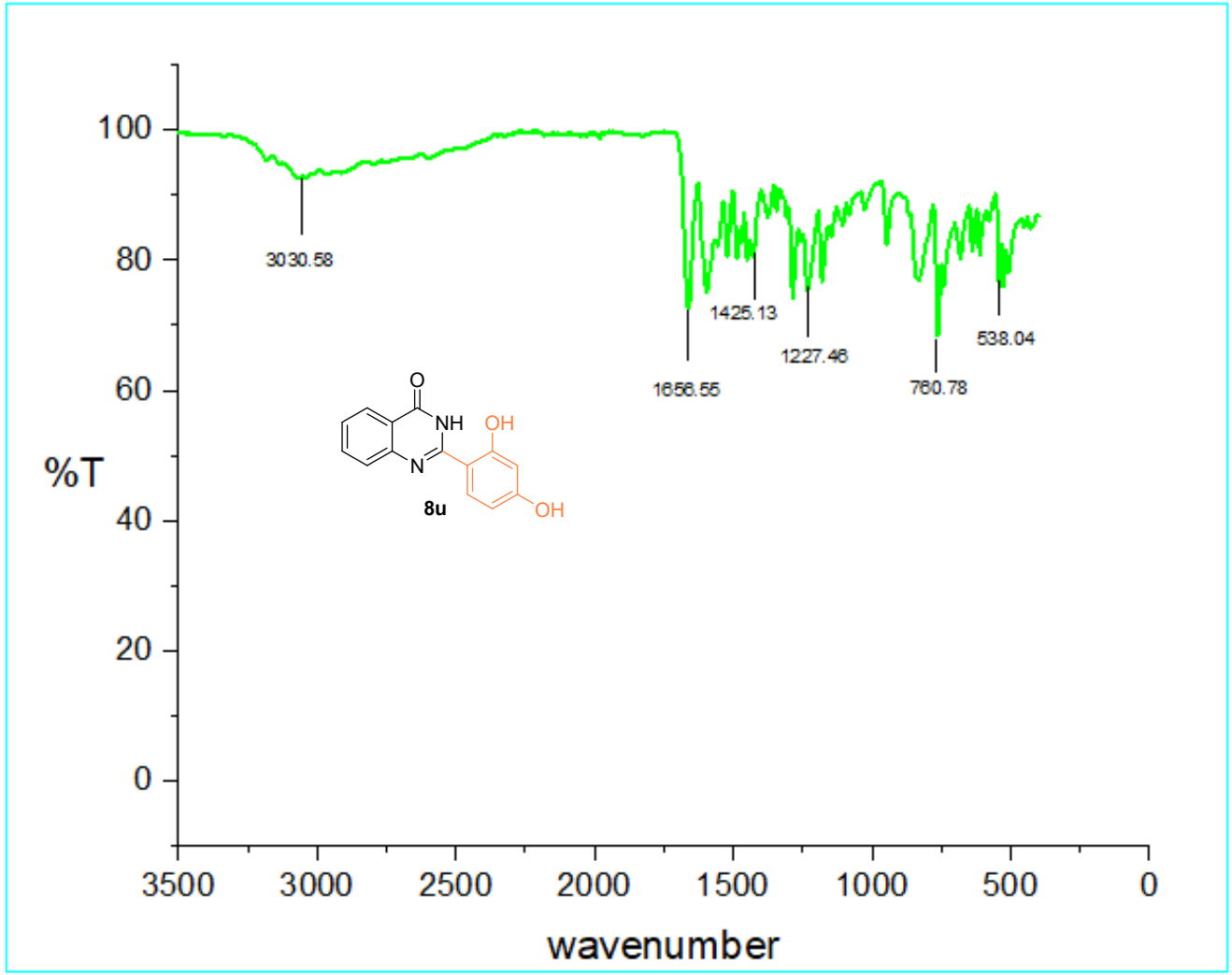

Figure 75: FT-IR spectrum of the compound **8u**.

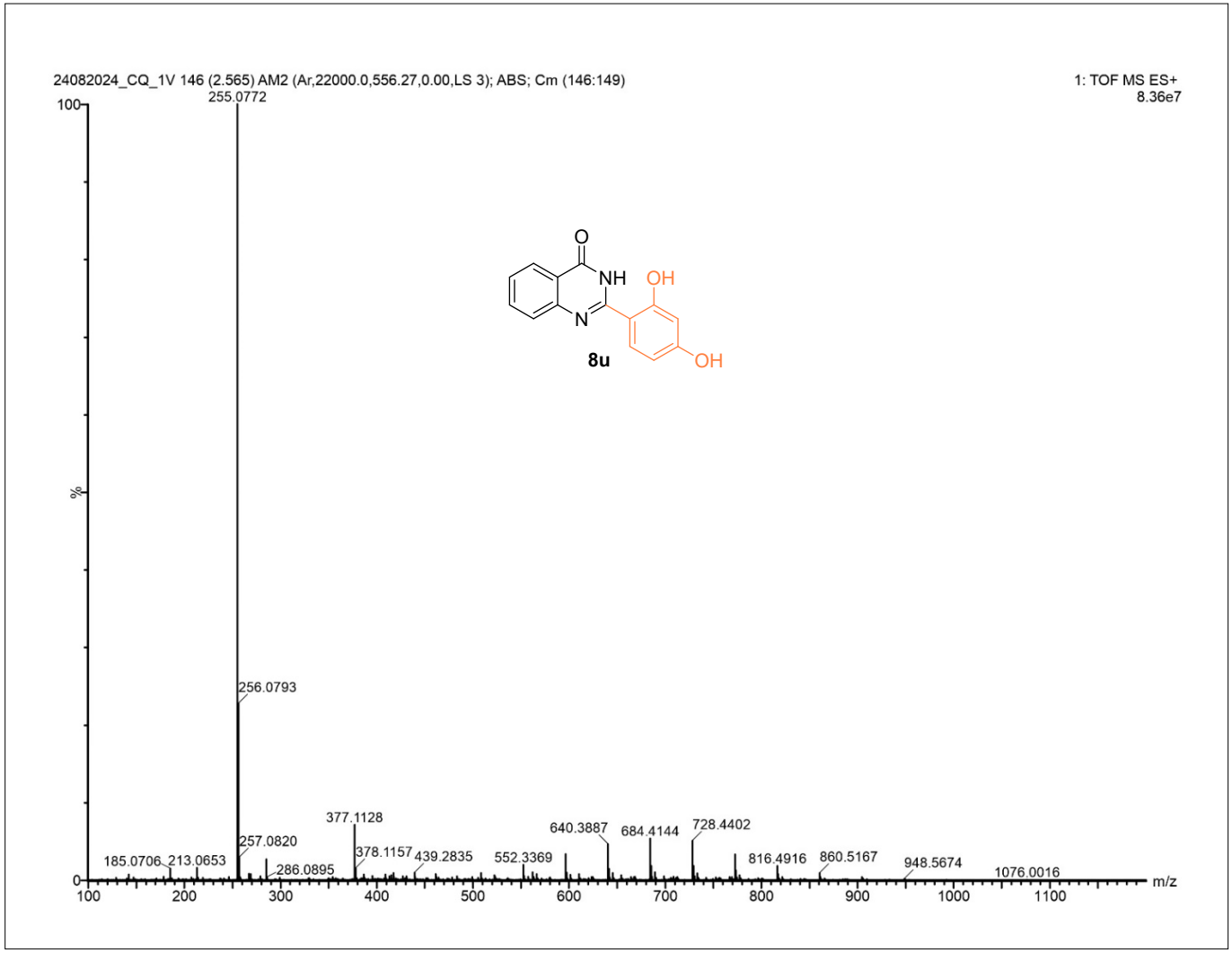

Figure 76: HRMS of the compound **8u**.

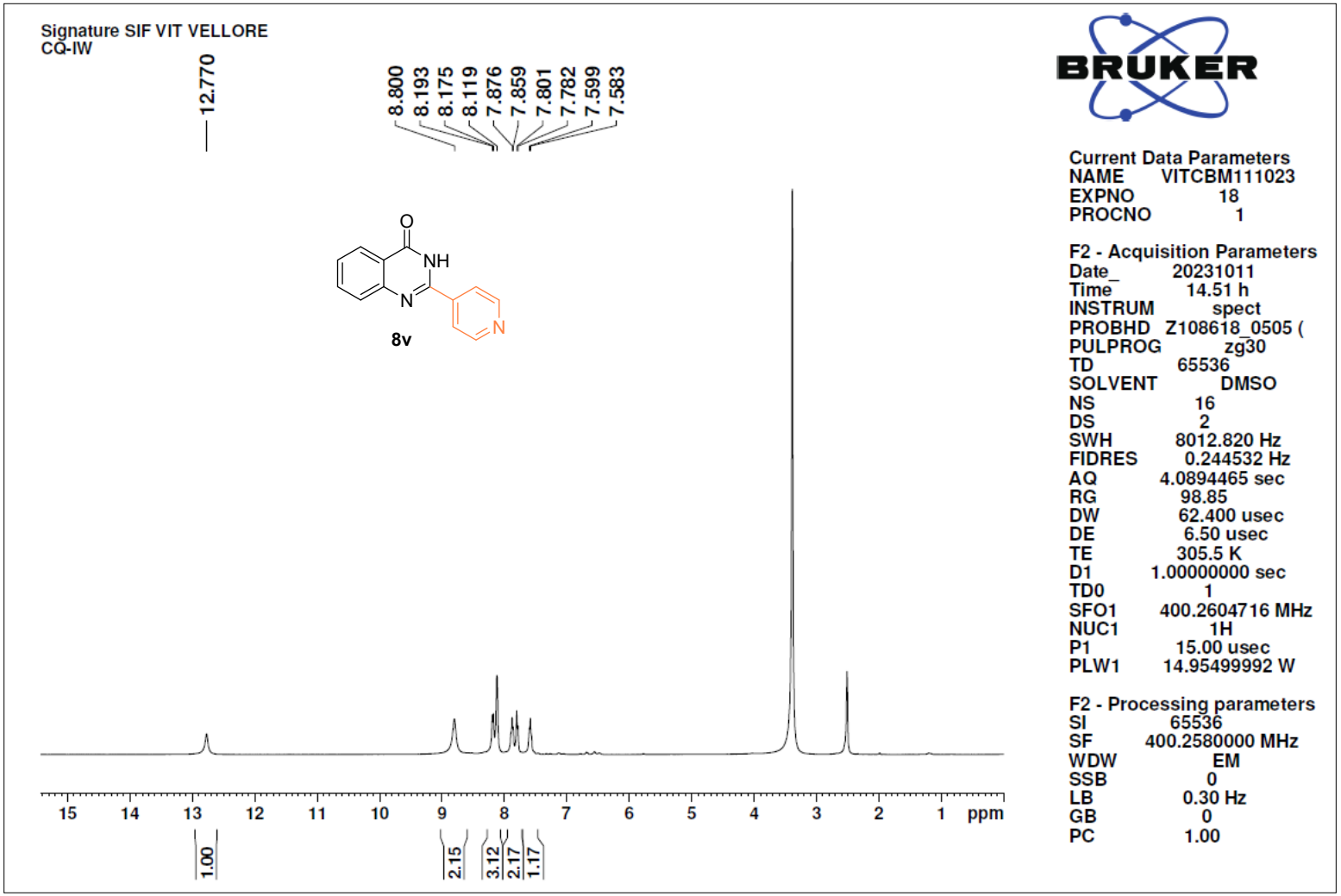

Figure 77: [1]H NMR spectrum of the compound **8v.**

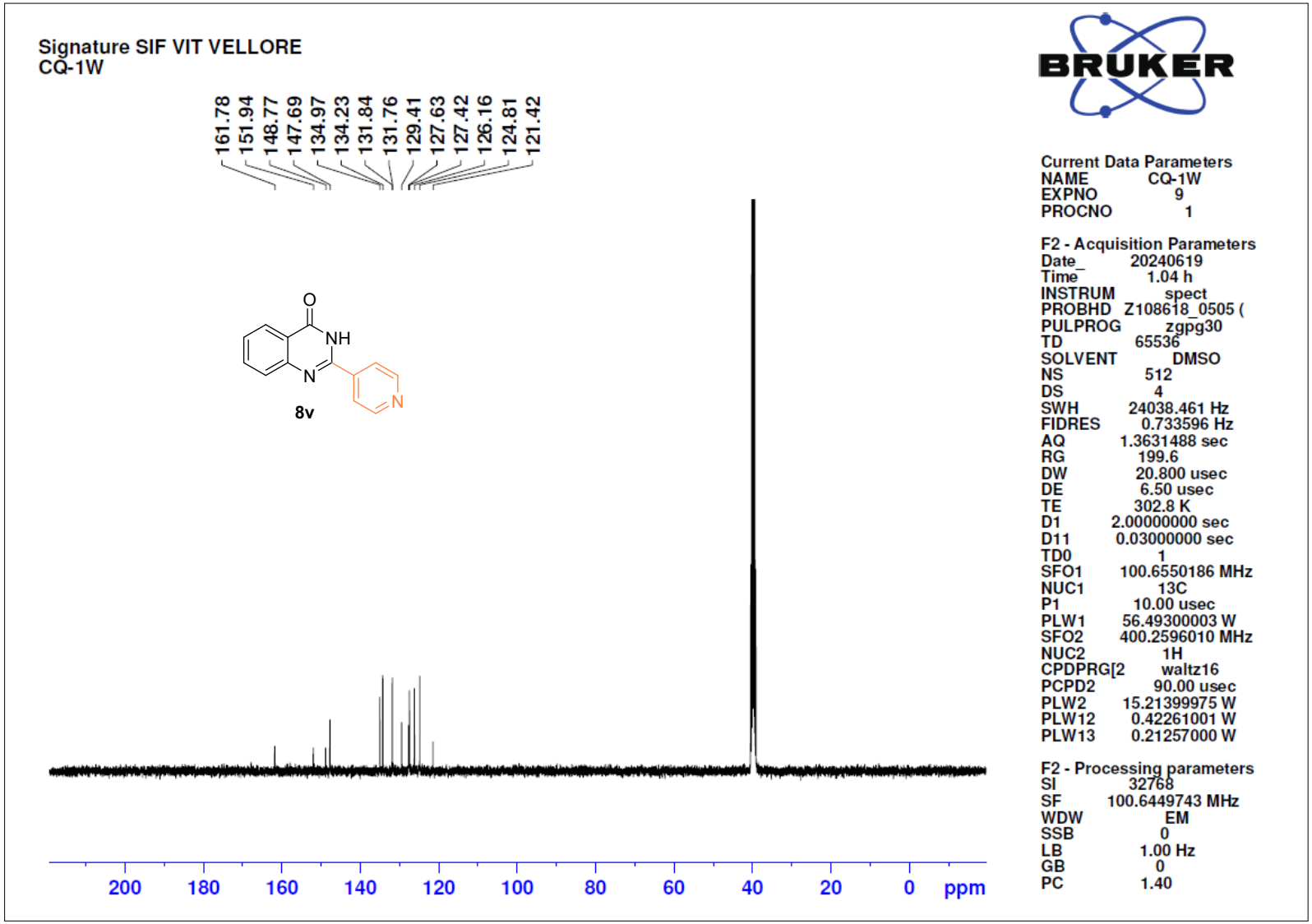

Figure 78: ^{13}C NMR spectrum of the compound **8v**.

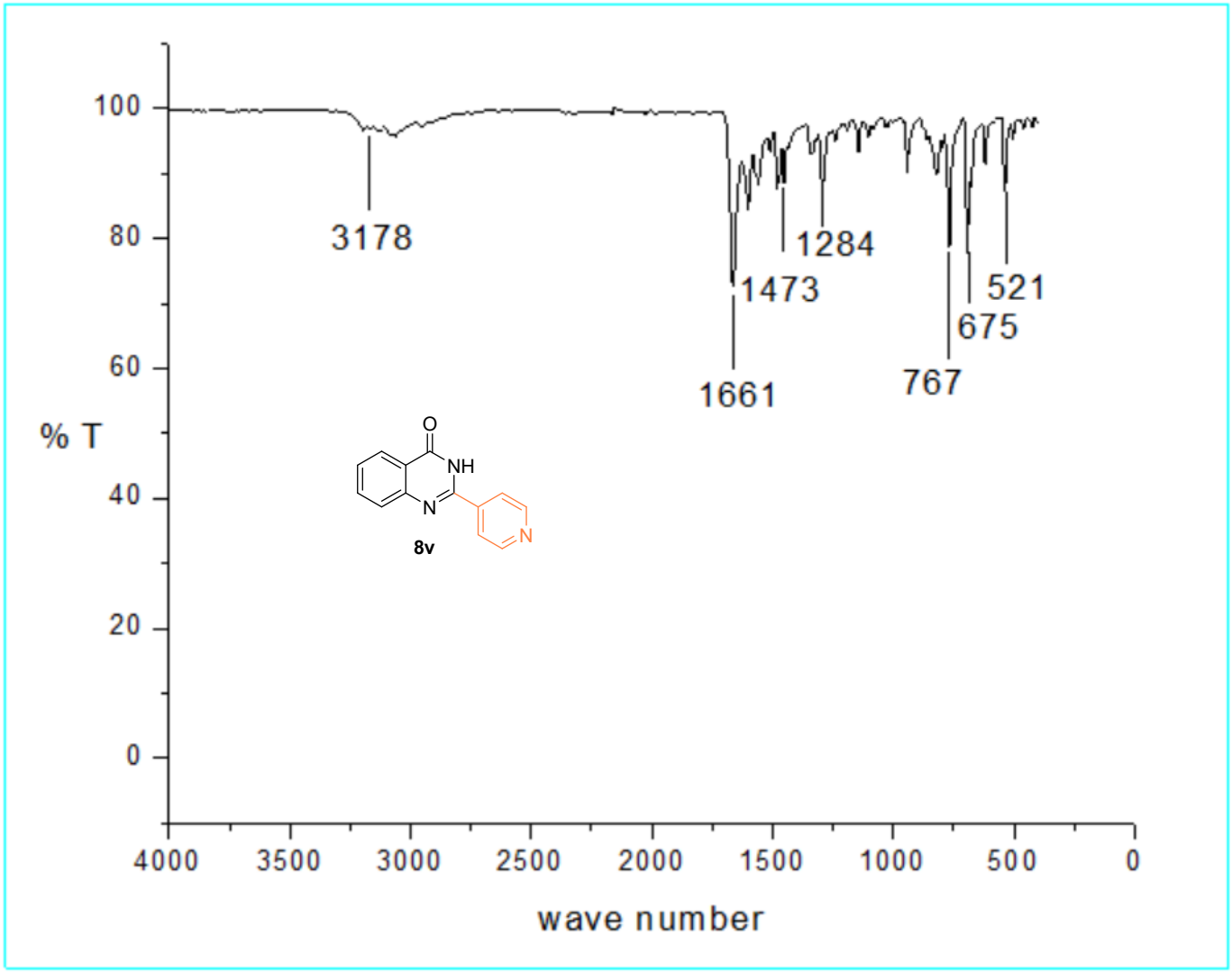

Figure 79: FT-IR spectrum of the compound **8v**.

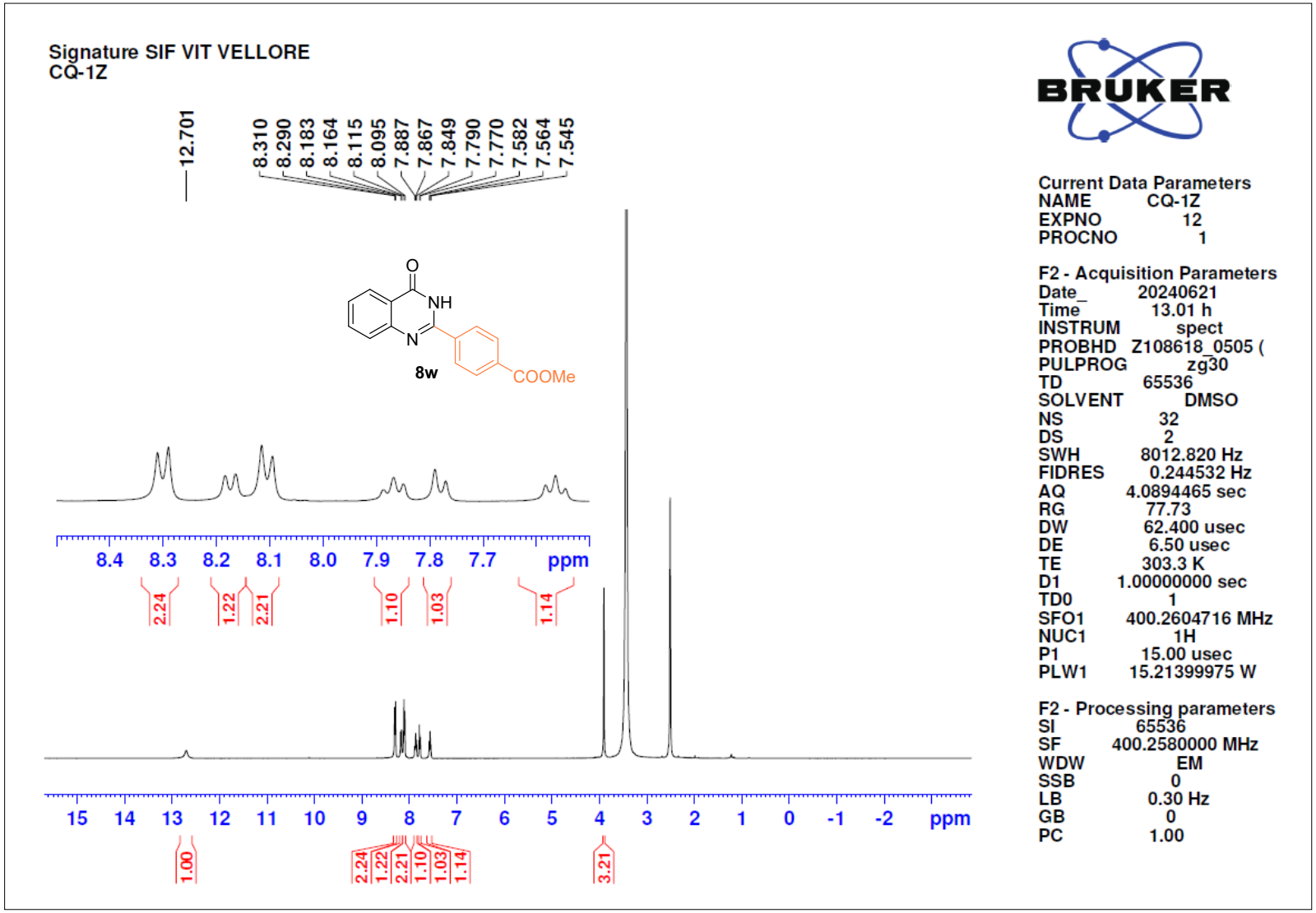

Figure 80: ^{1}H NMR spectrum of the compound **8w.**

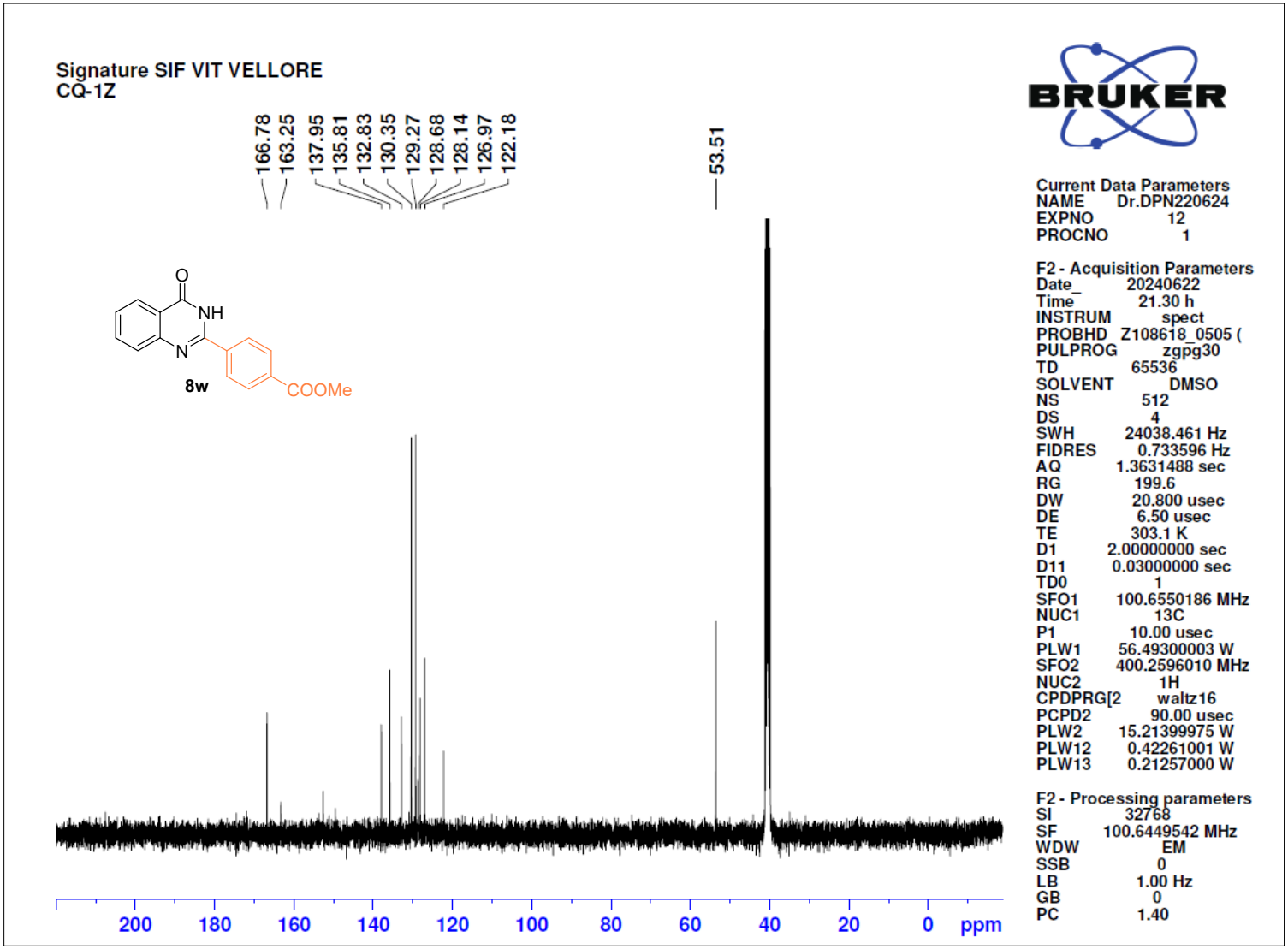

Figure 81: ^{13}C NMR spectrum of the compound **8w**.

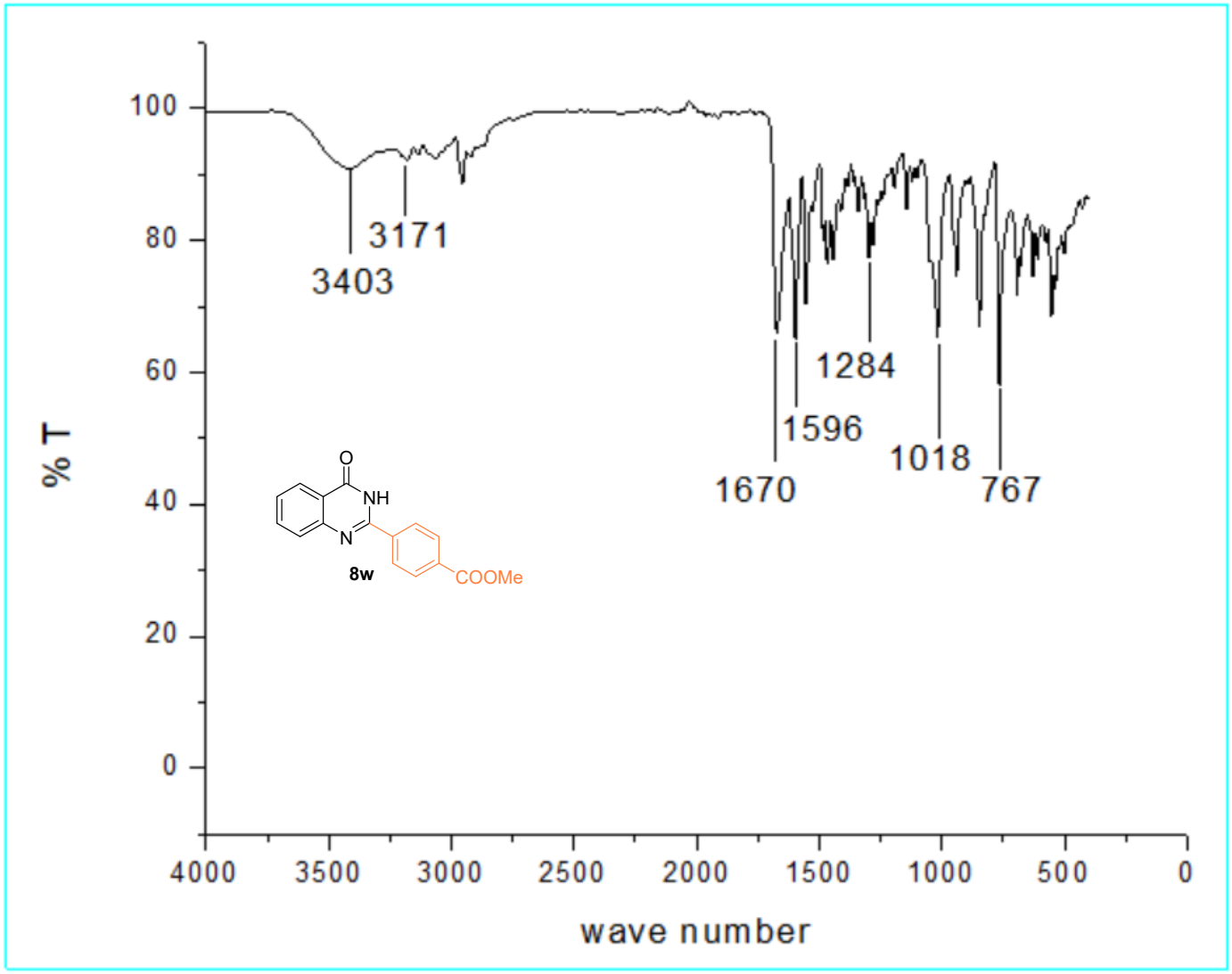

Figure 82: FT-IR spectrum of the compound **8w**.

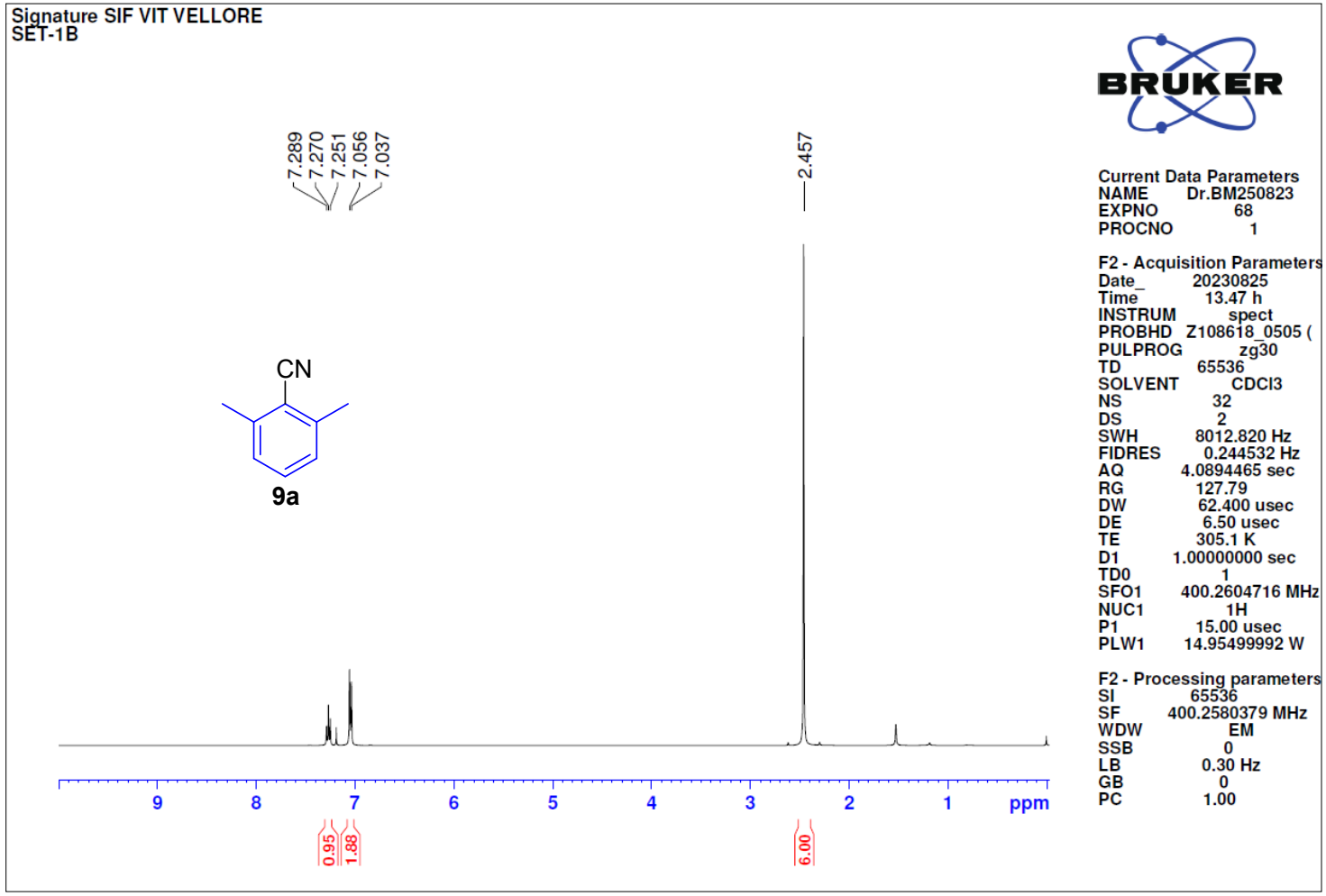

Figure 83: ^{1}H NMR spectrum of the compound **9a.**

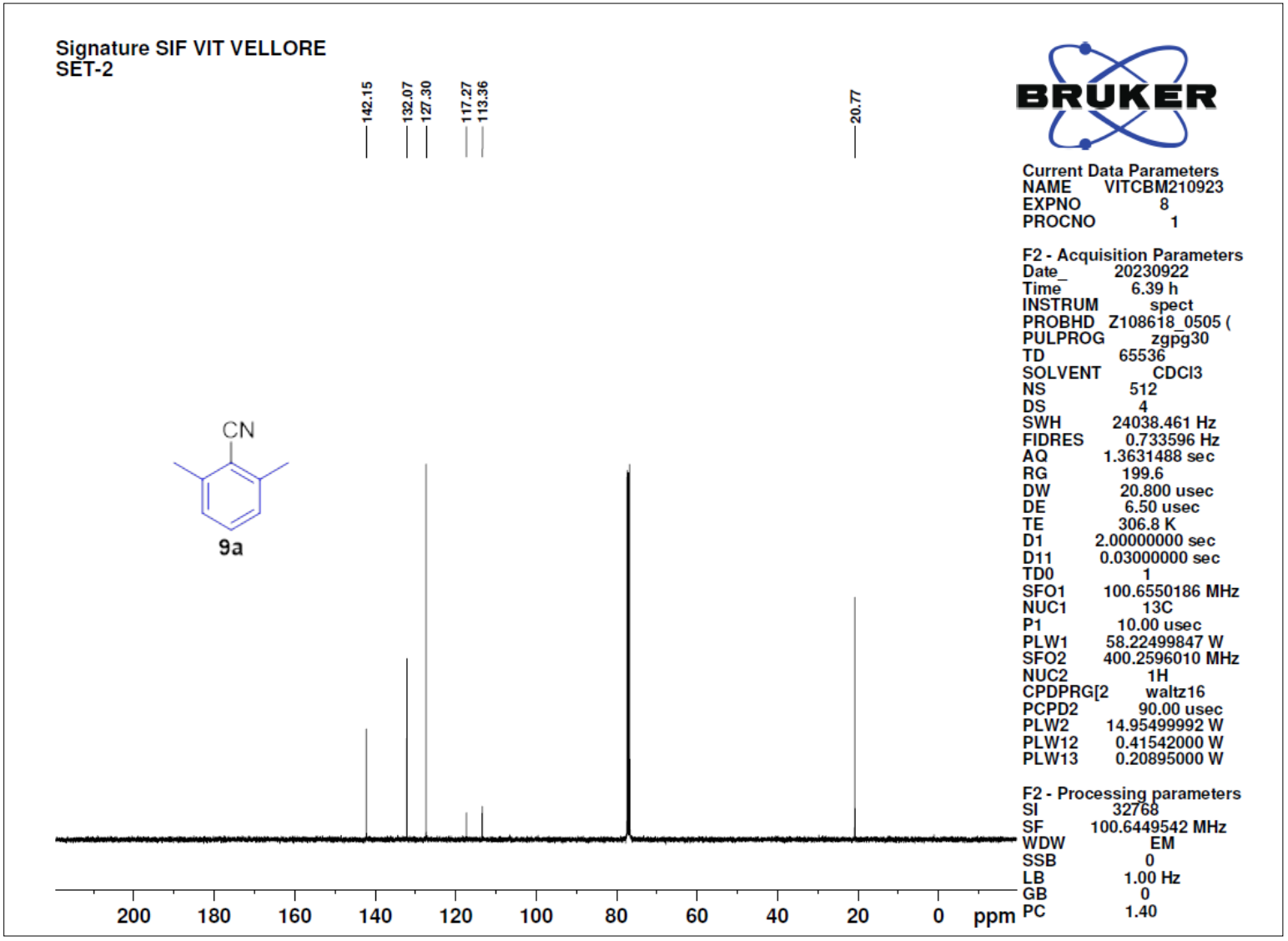

Figure 84: ^{13}C NMR spectrum of the compound **9a**.

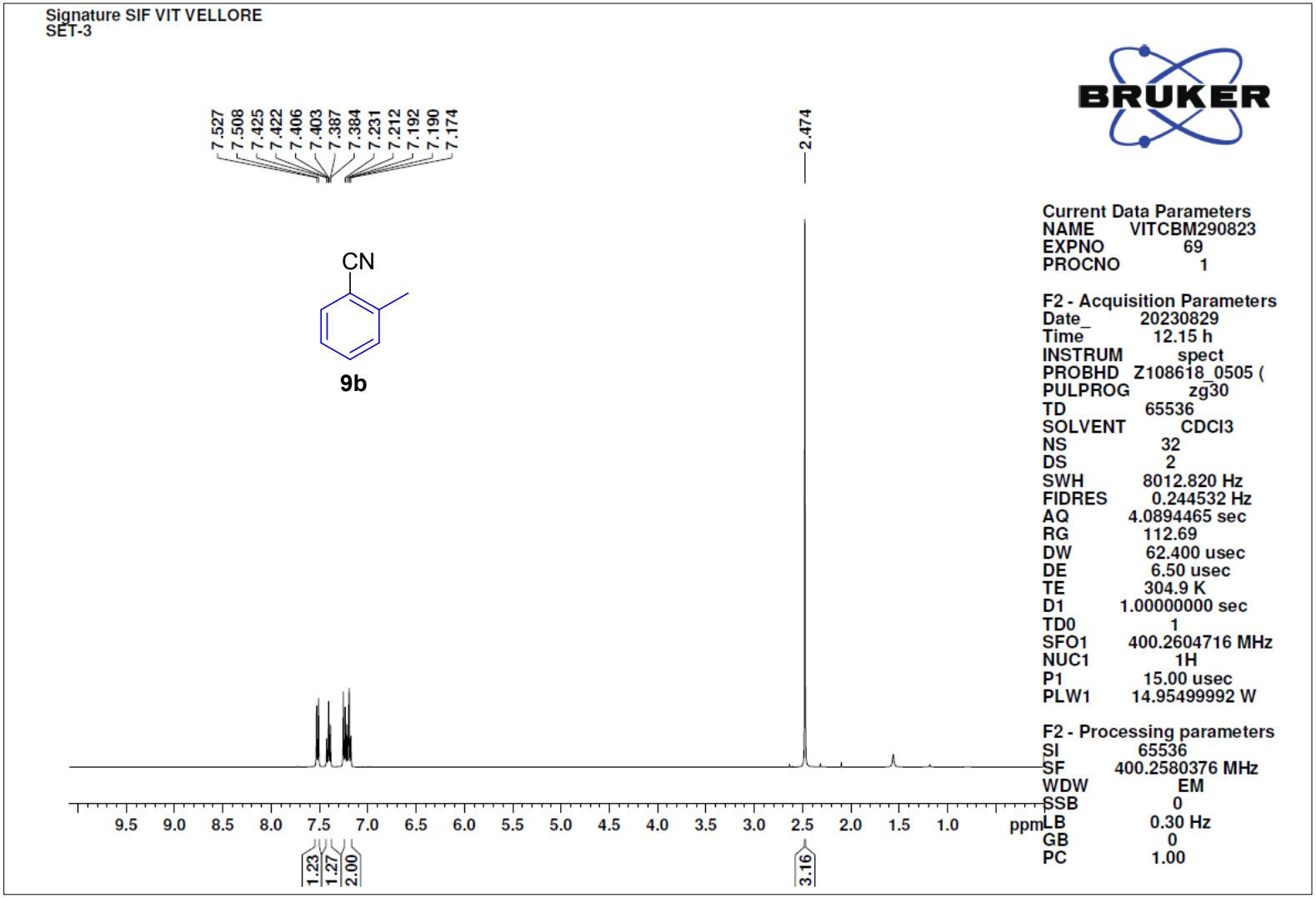

Figure 85: ^{1}H NMR spectrum of the compound **9b.**

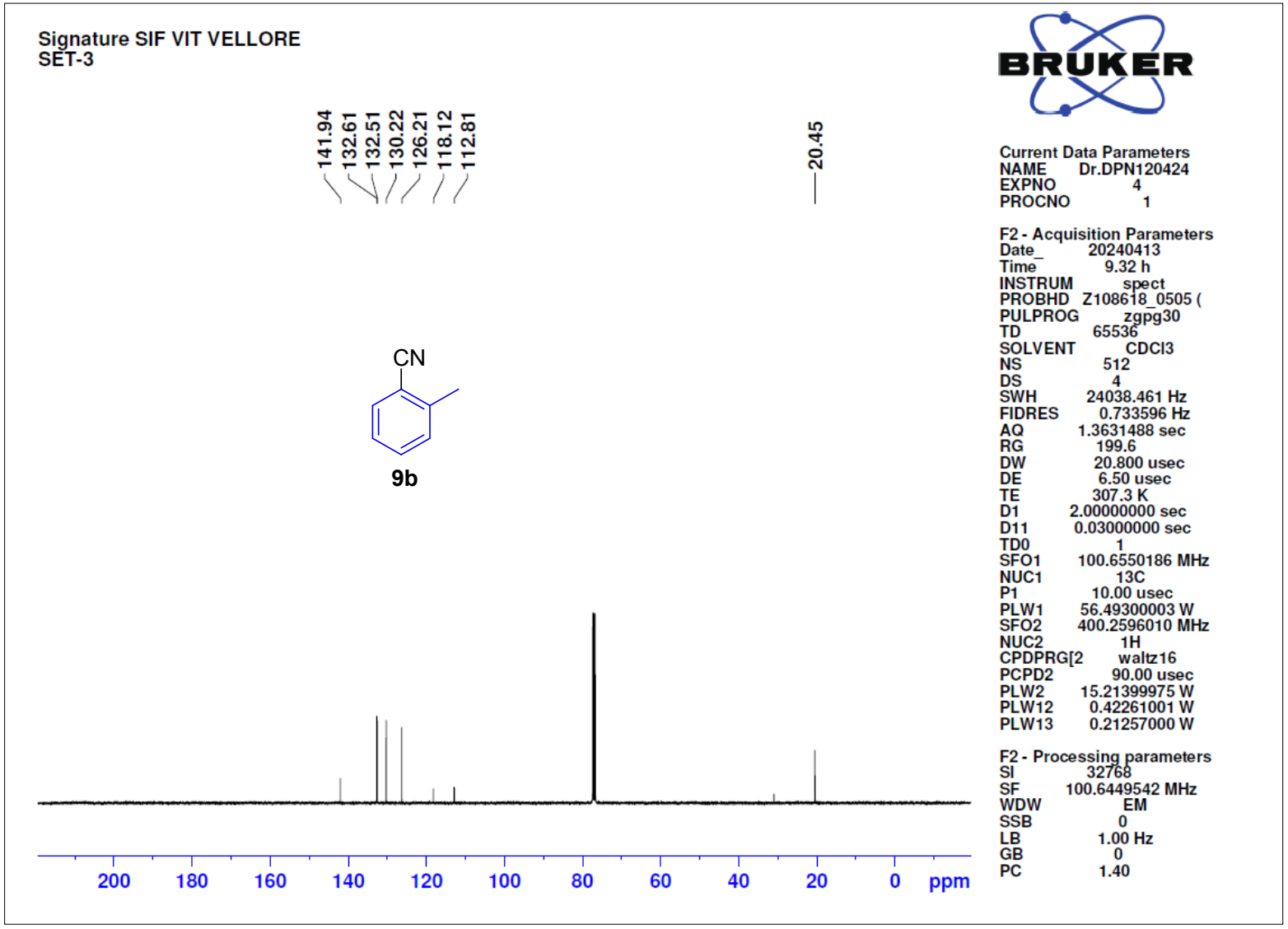

Figure 86: ^{13}C NMR spectrum of the compound **9b**.

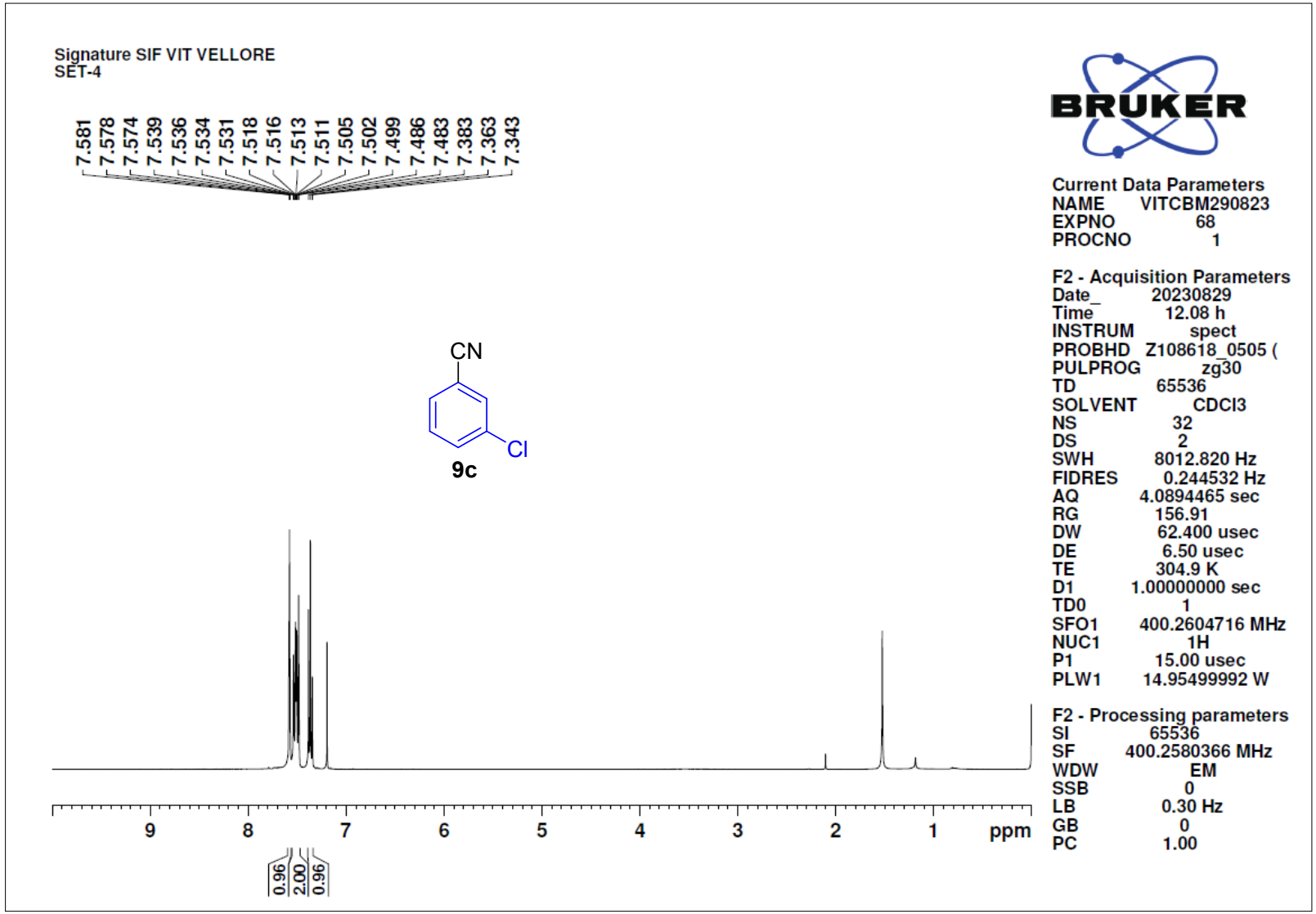

Figure 87: ^{1}H NMR spectrum of the compound **9c.**

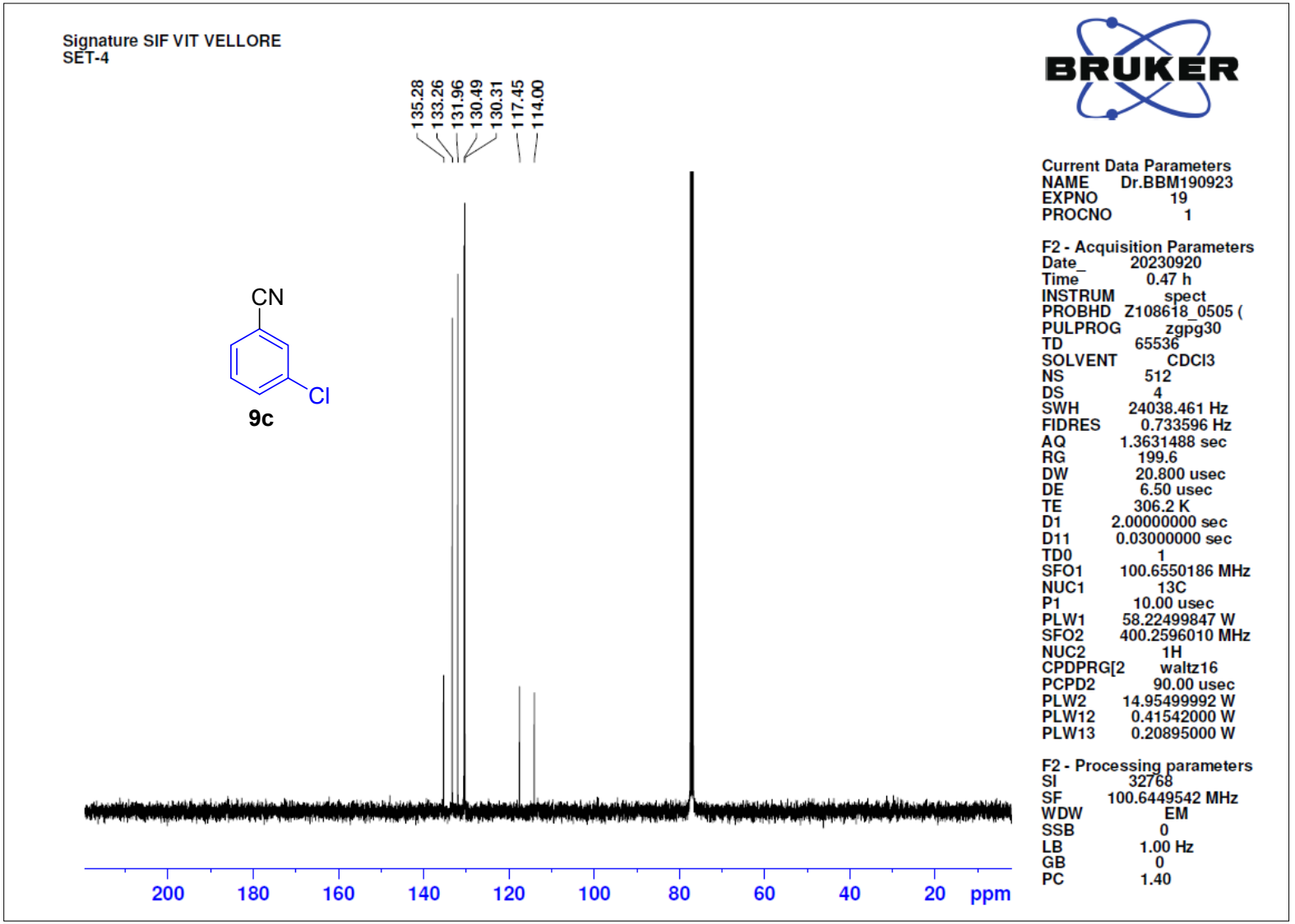

Figure 88: ^{13}C NMR spectrum of the compound **9c**.

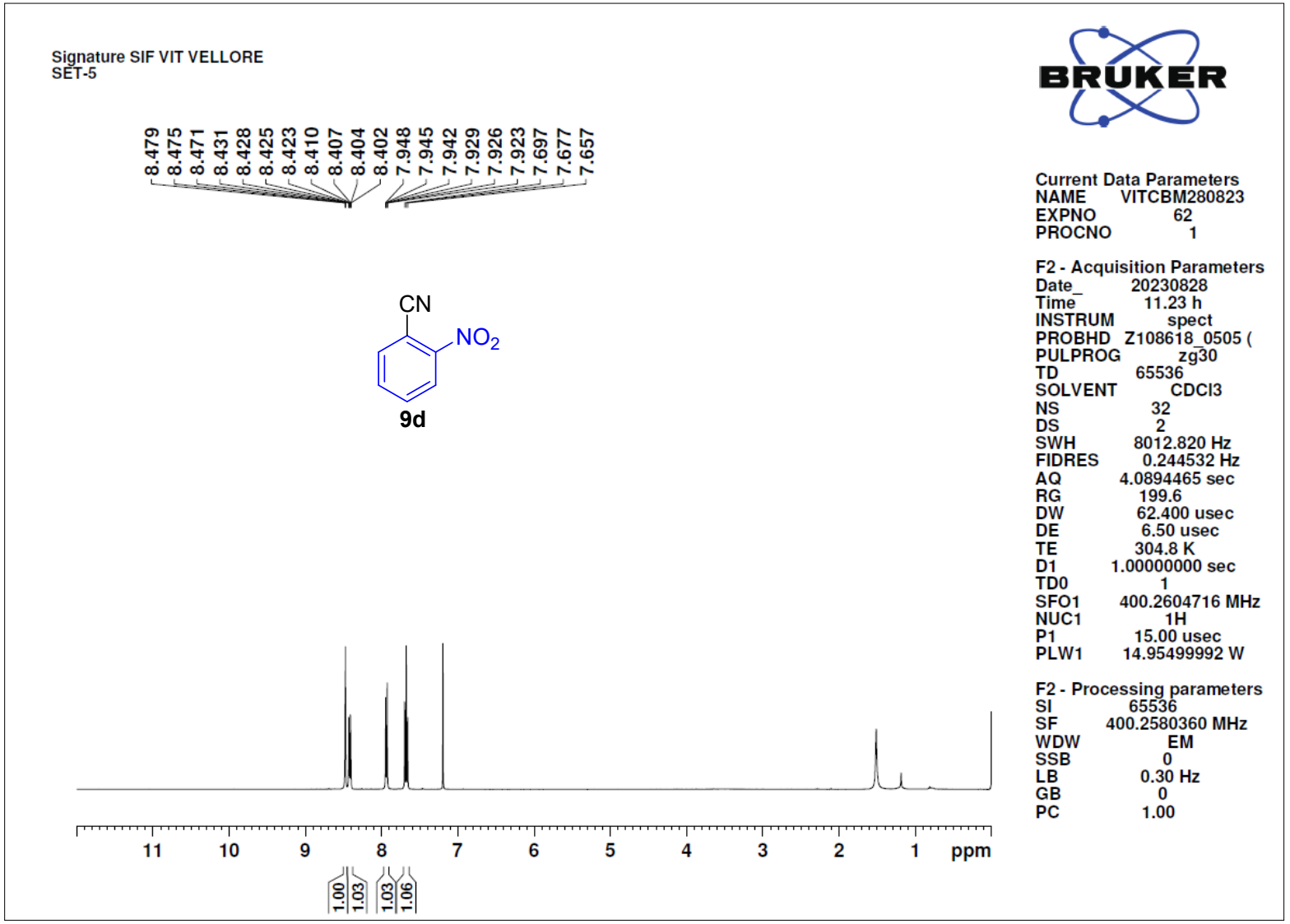

Figure 89: ^{1}H NMR spectrum of the compound **9d.**

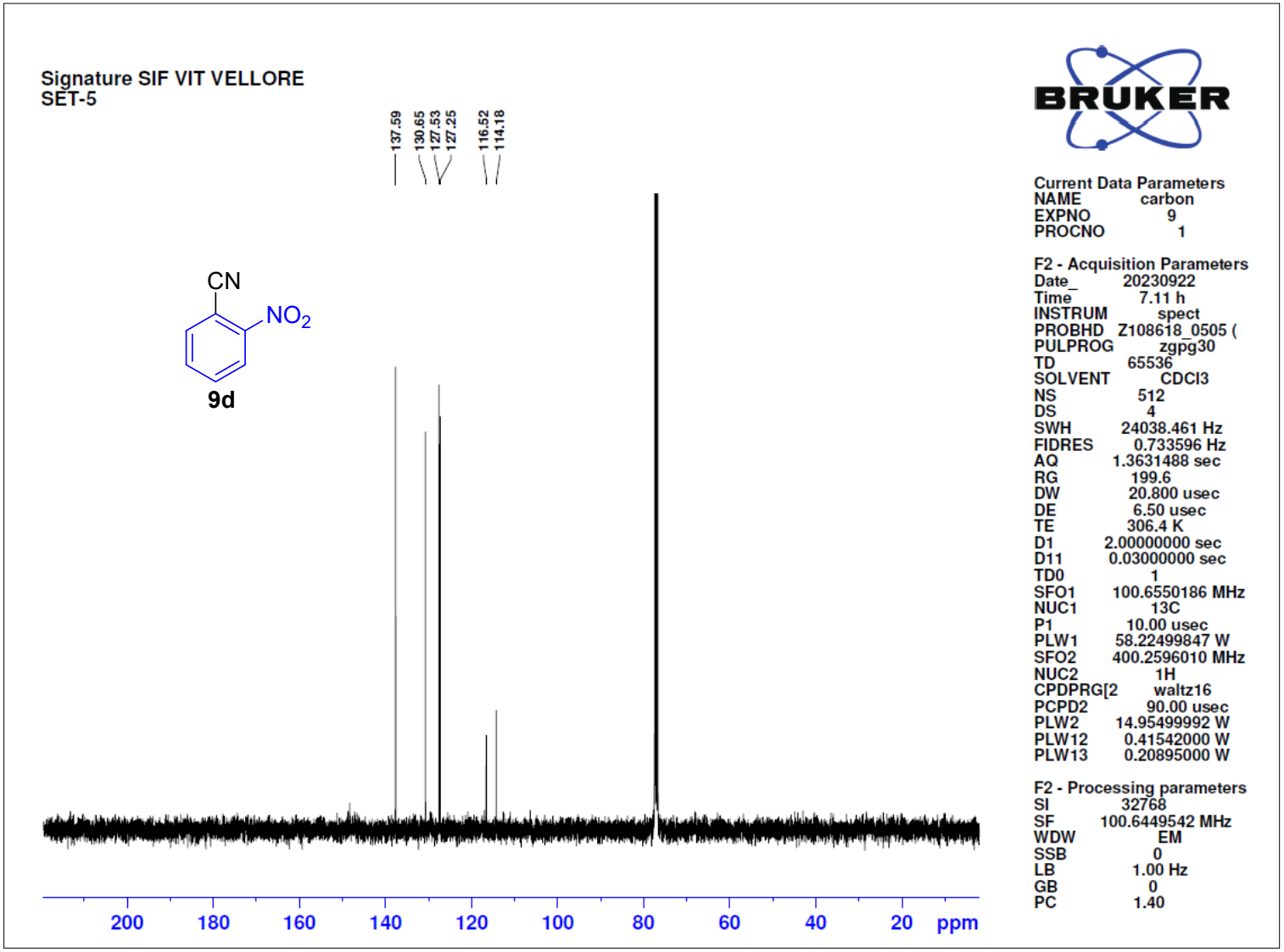

Figure 90: ^{13}C NMR spectrum of the compound **9d**.

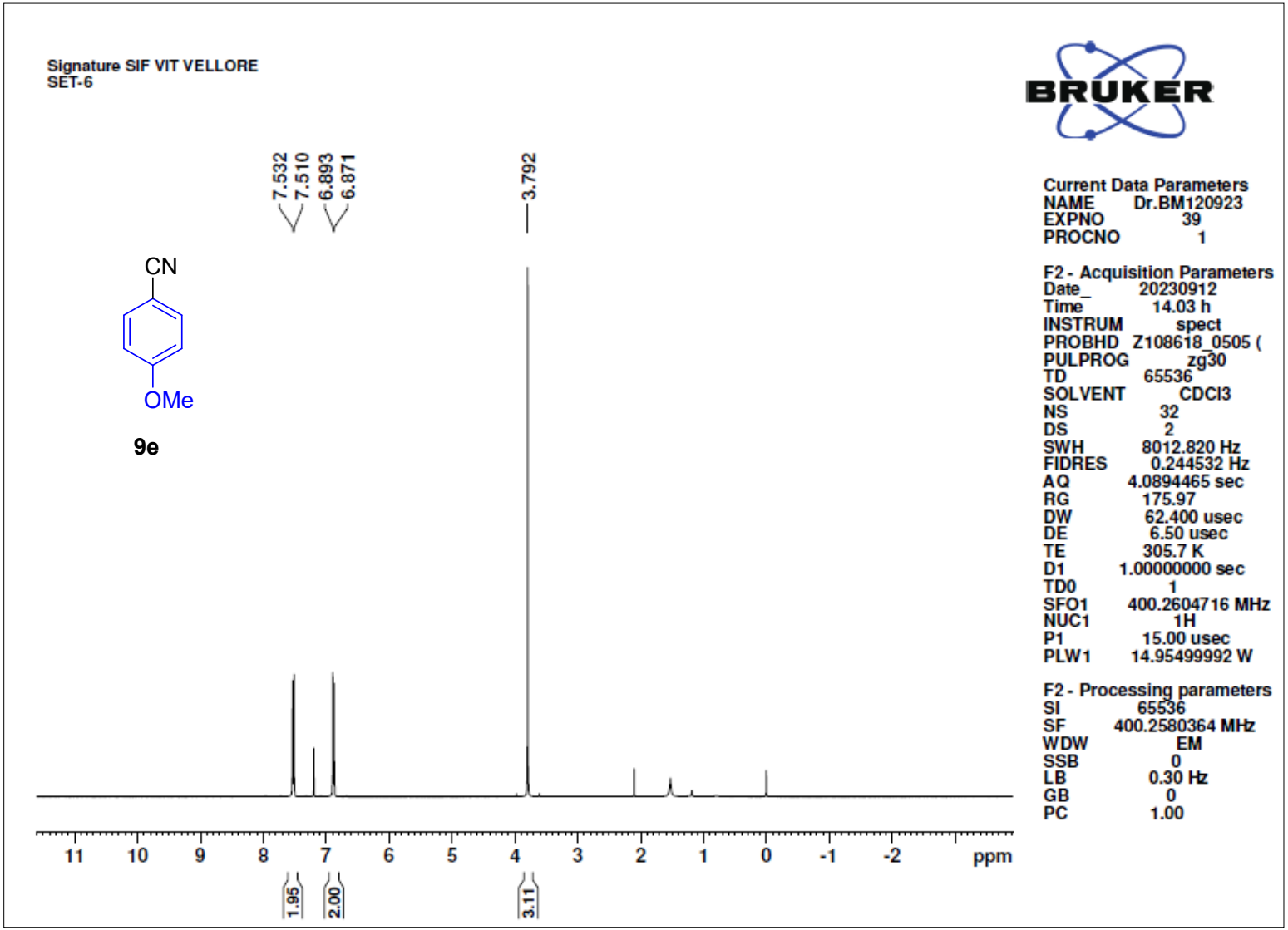

Figure 91: ^{1}H NMR spectrum of the compound **9e.**

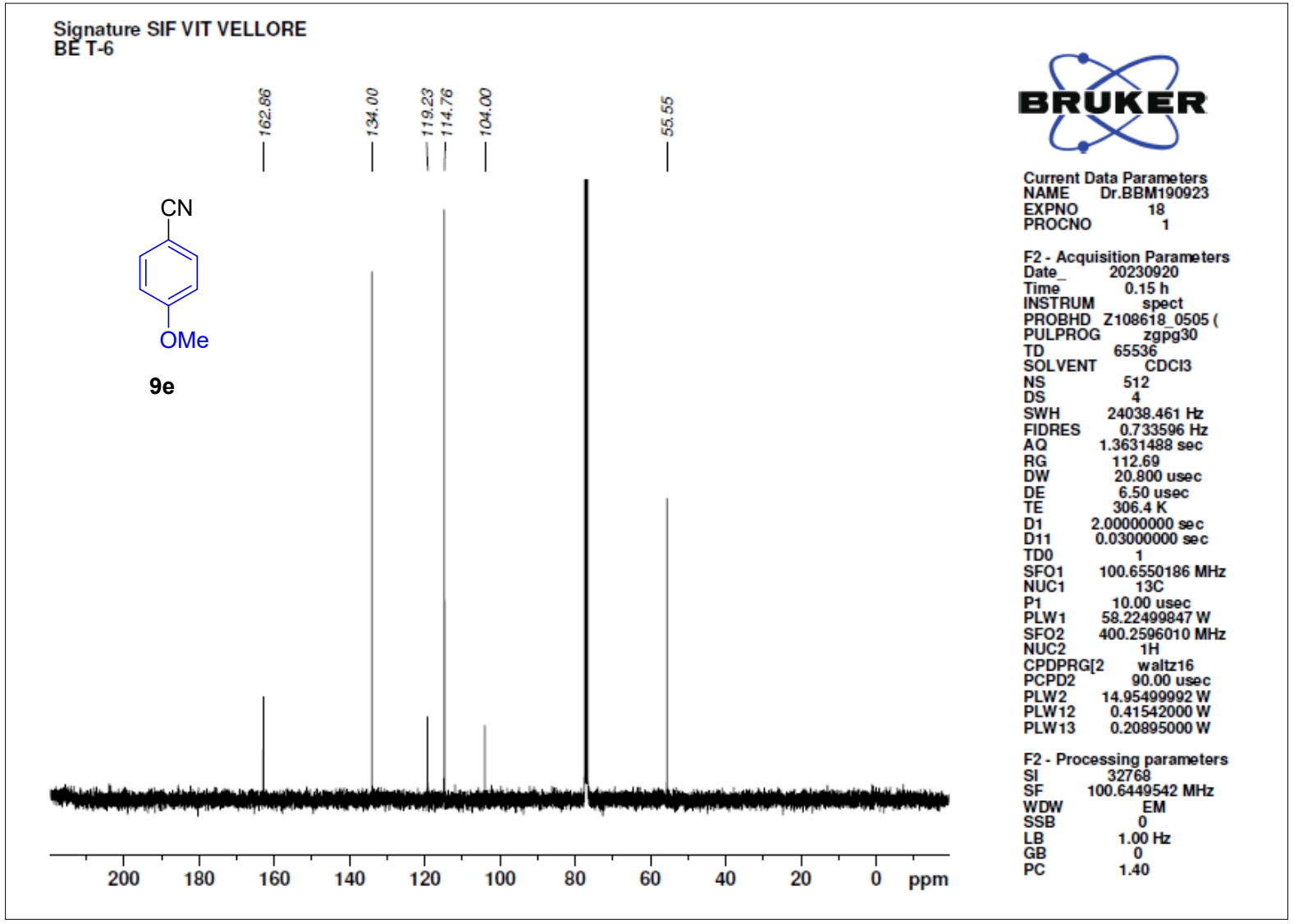

Figure 92: ^{13}C NMR spectrum of the compound **9e**.

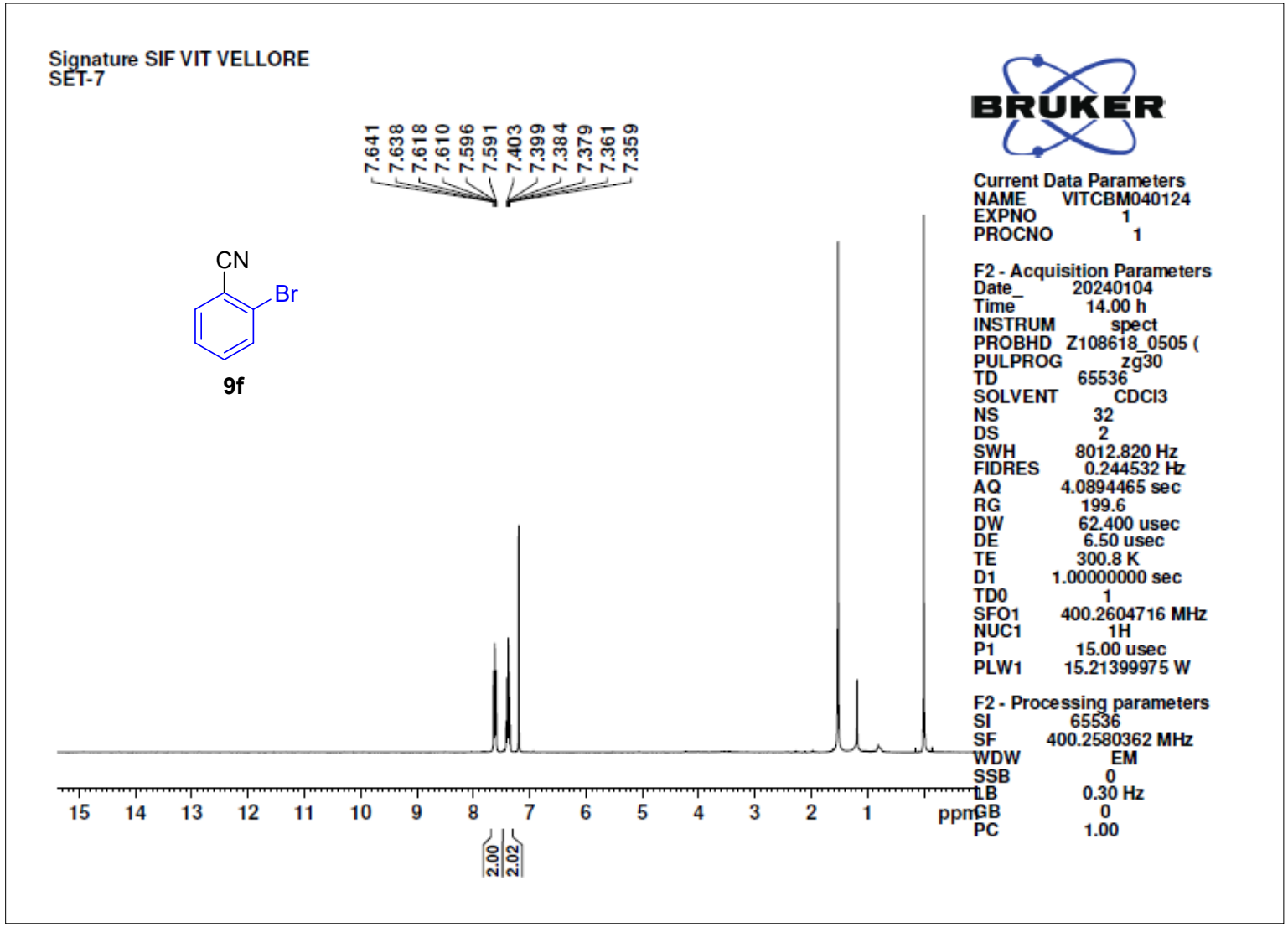

Figure 93: ^{1}H NMR spectrum of the compound **9f.**

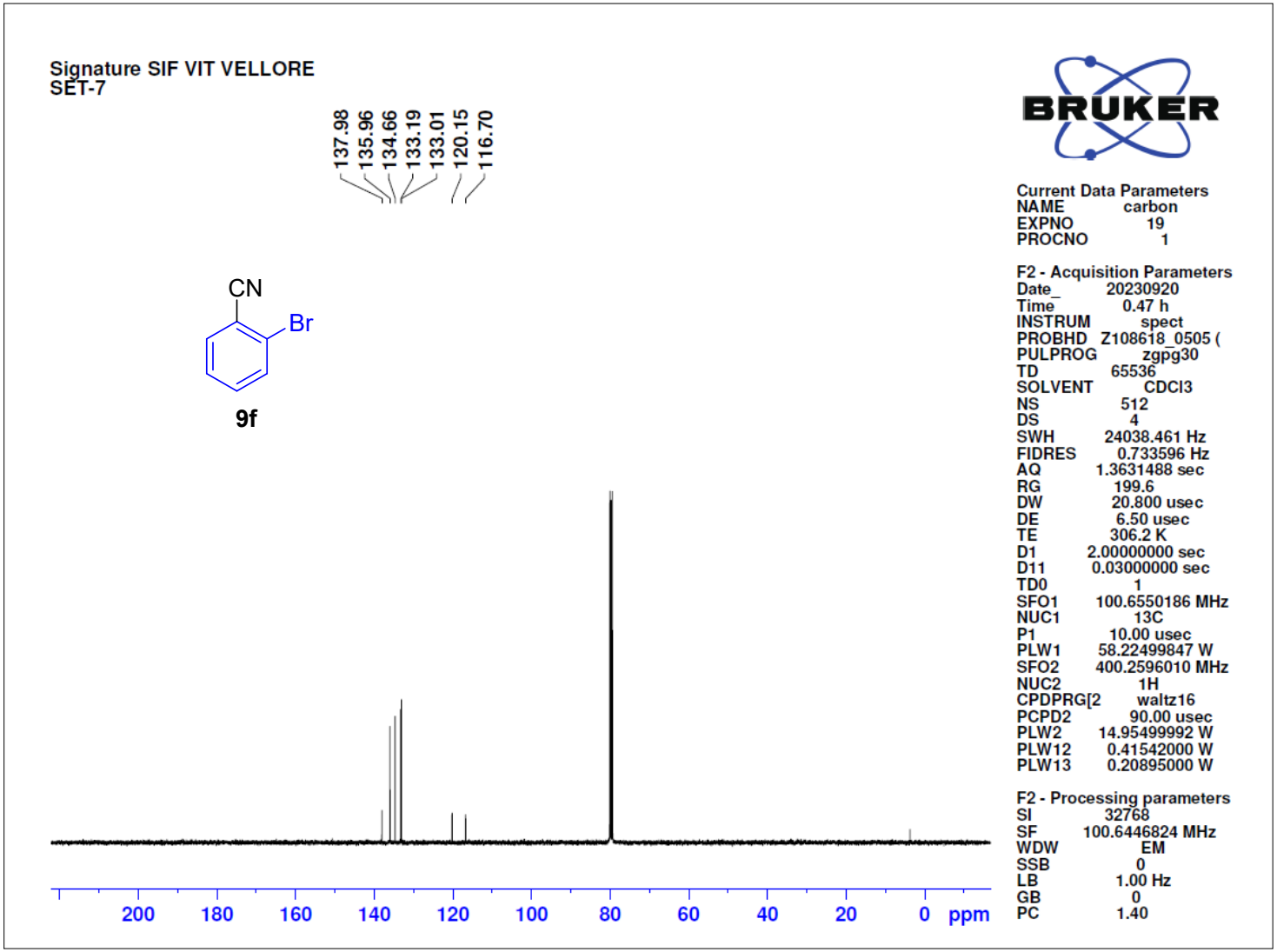

Figure 94: ^{13}C NMR spectrum of the compound **9f**.

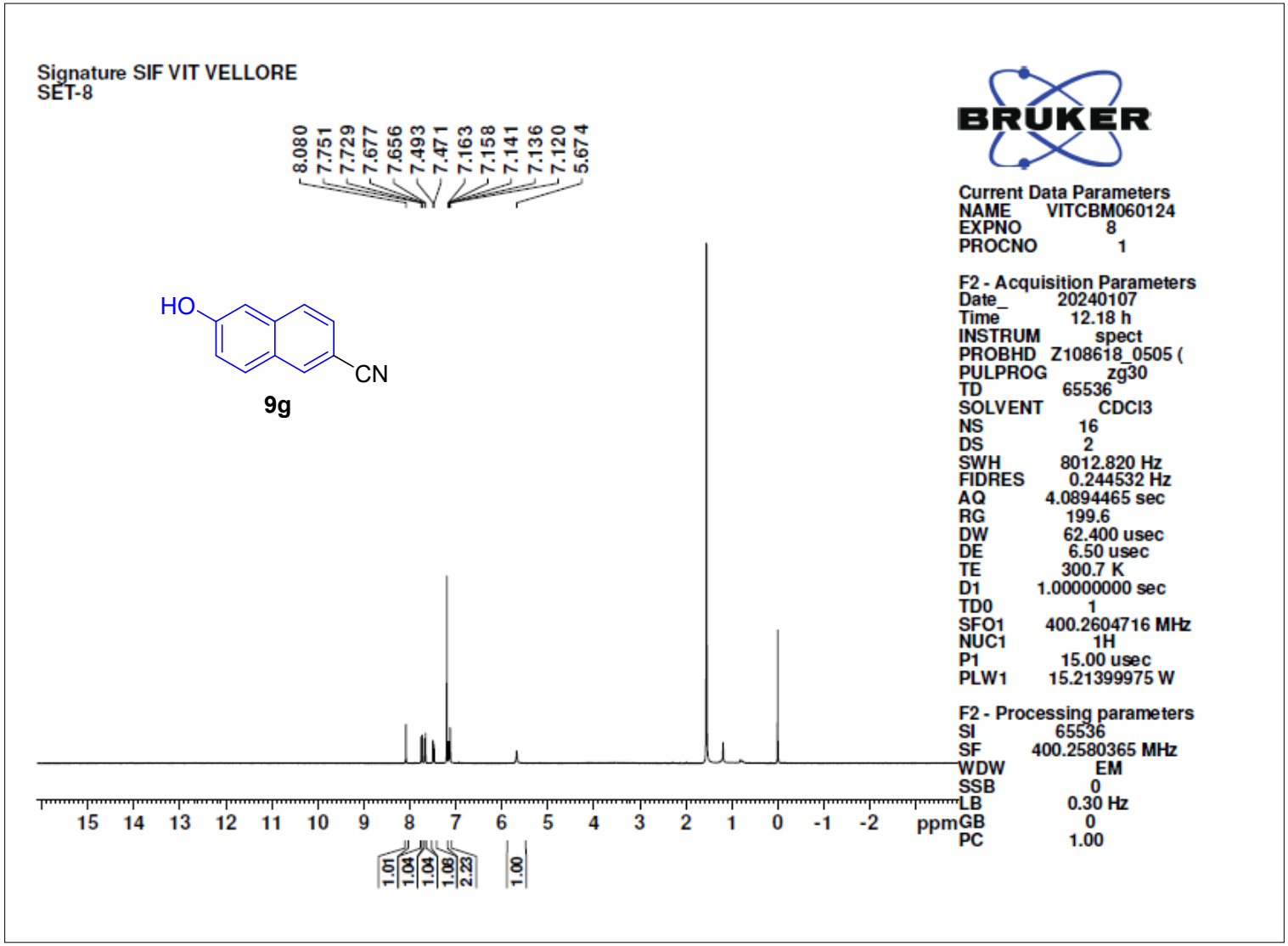

Figure 95: ^{1}H NMR spectrum of the compound **9g.**

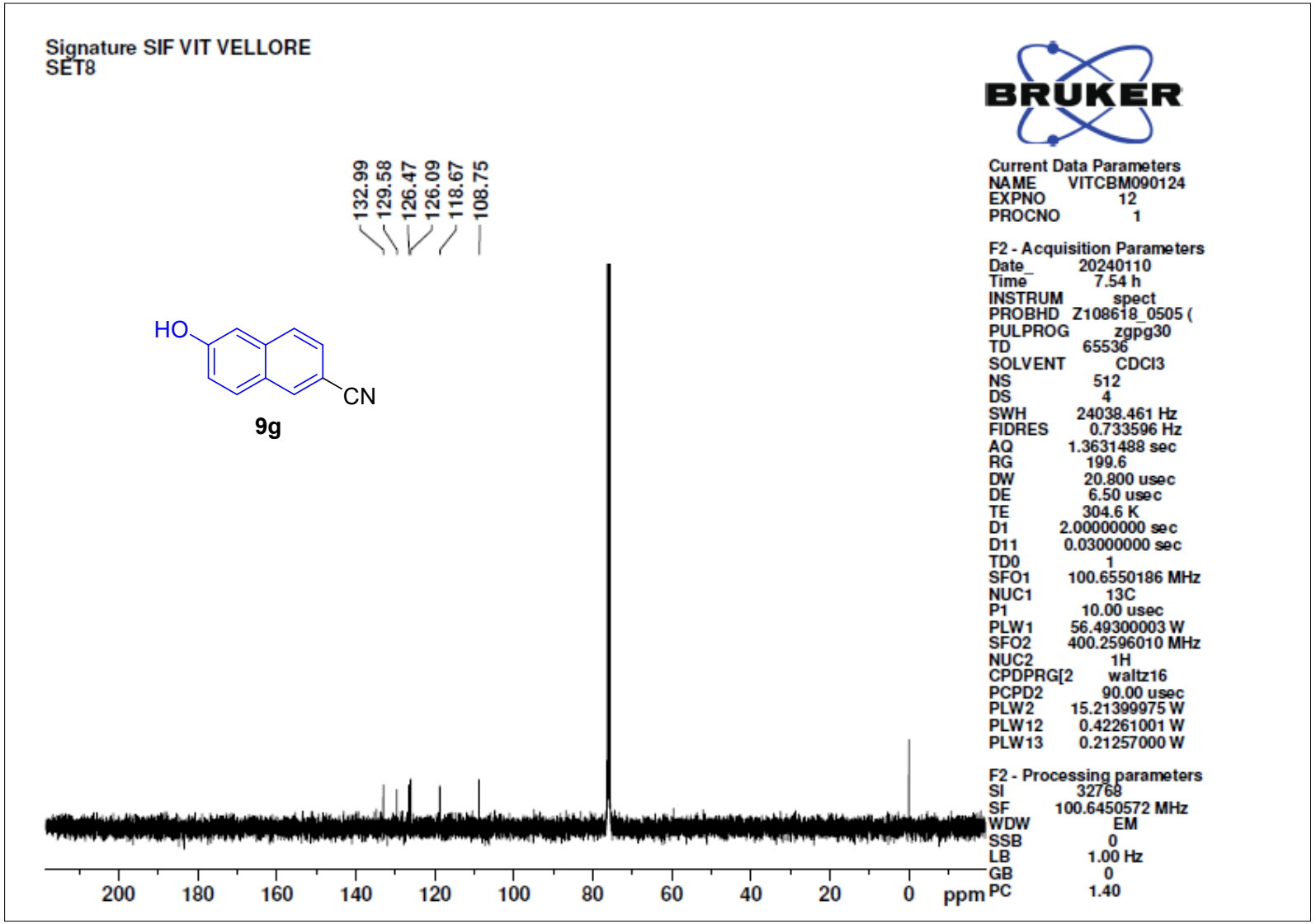

Figure 96: ^{13}C NMR spectrum of the compound **9g**.

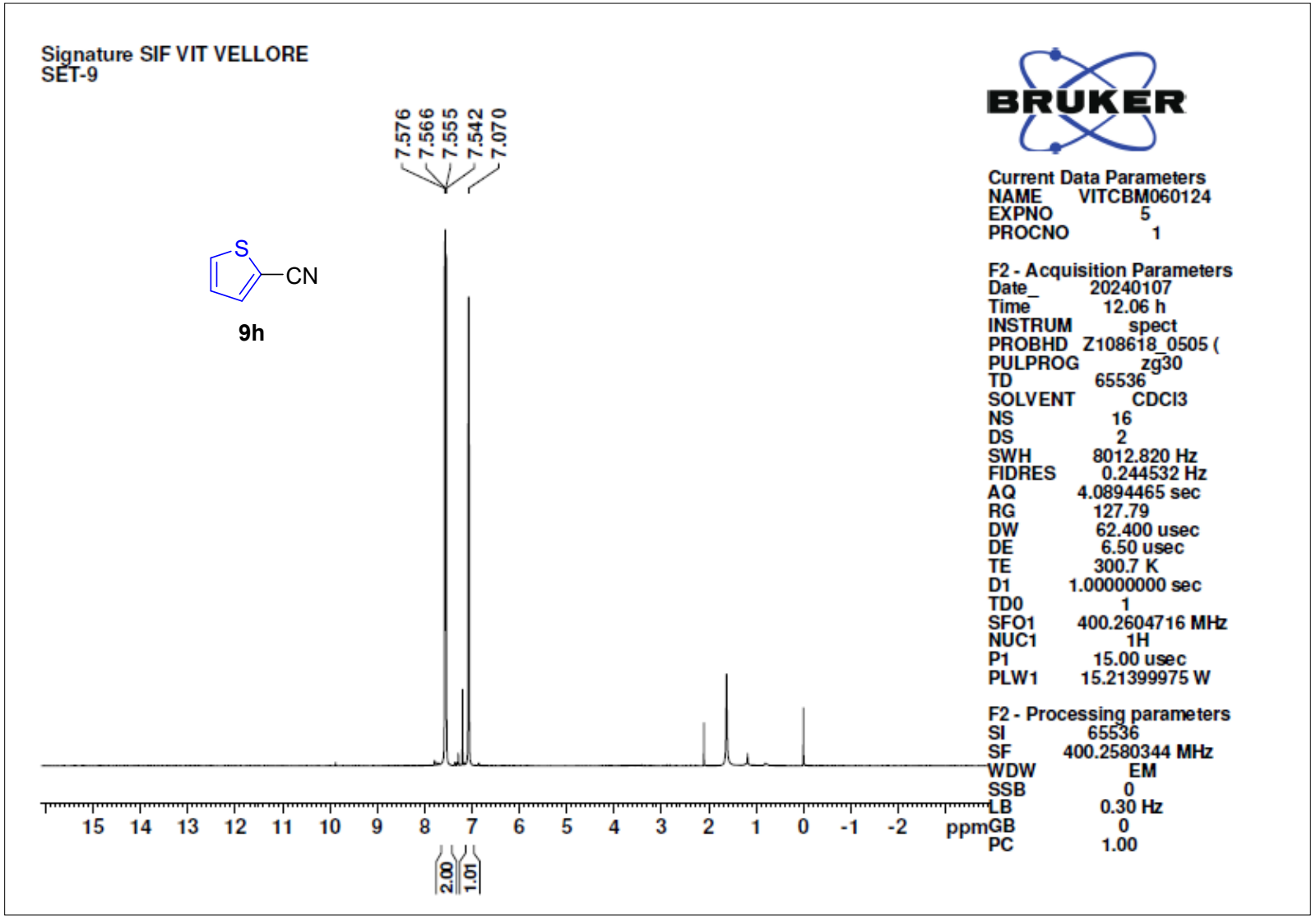

Figure 97: ^{1}H NMR spectrum of the compound **9h.**

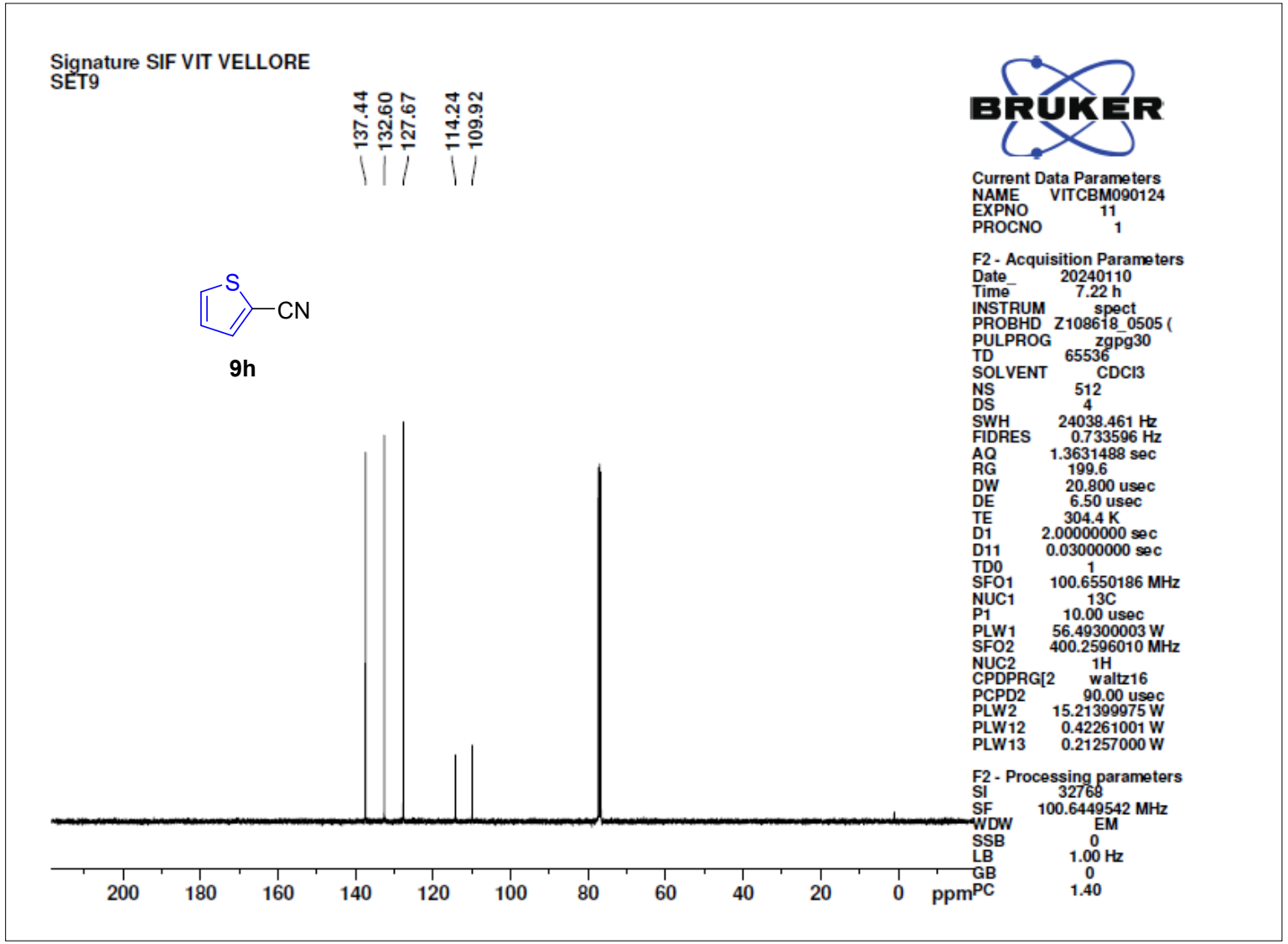

Figure 98: ^{13}C NMR spectrum of the compound **9h**.

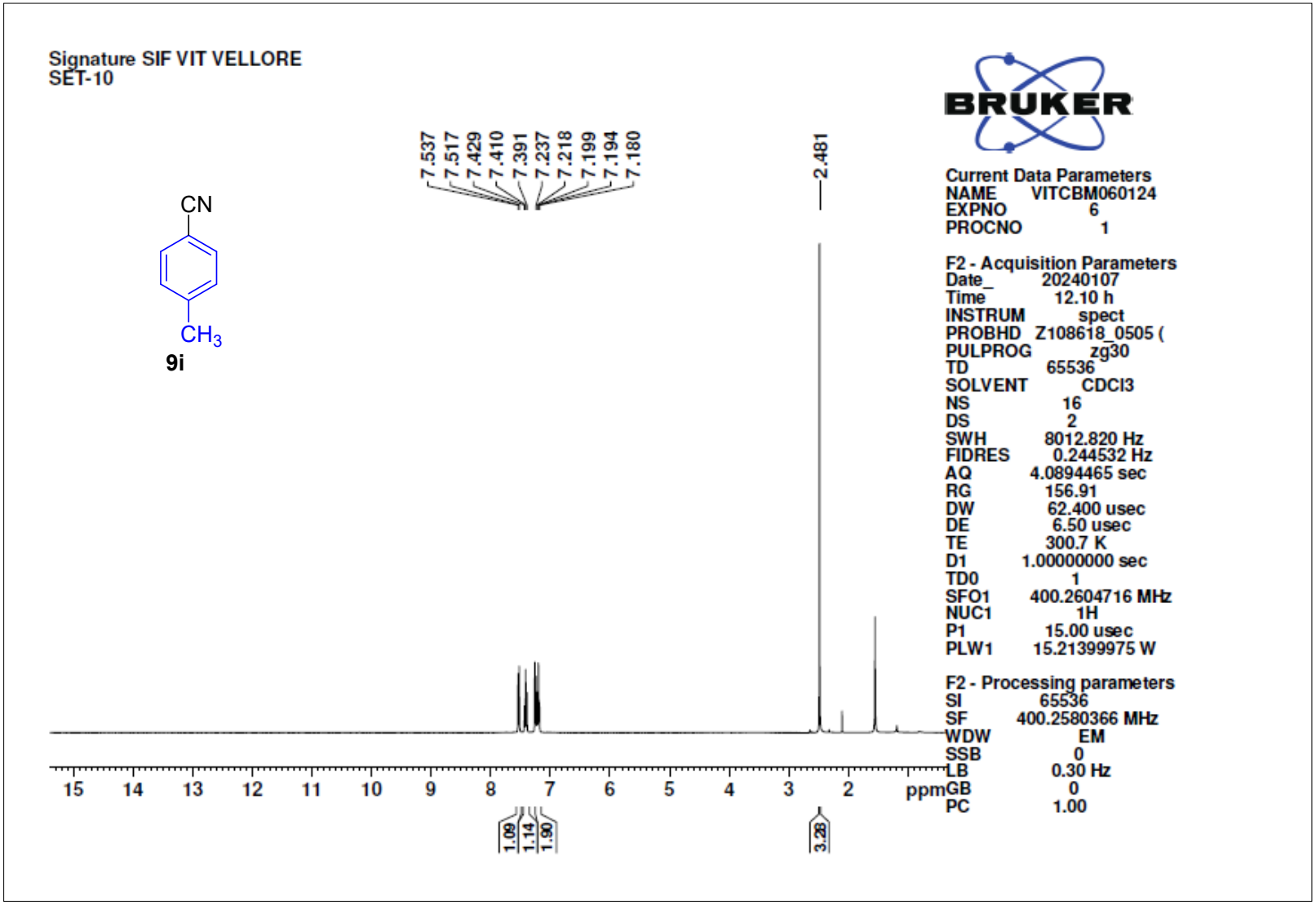

Figure 99: ^{1}H NMR spectrum of the compound **9i.**

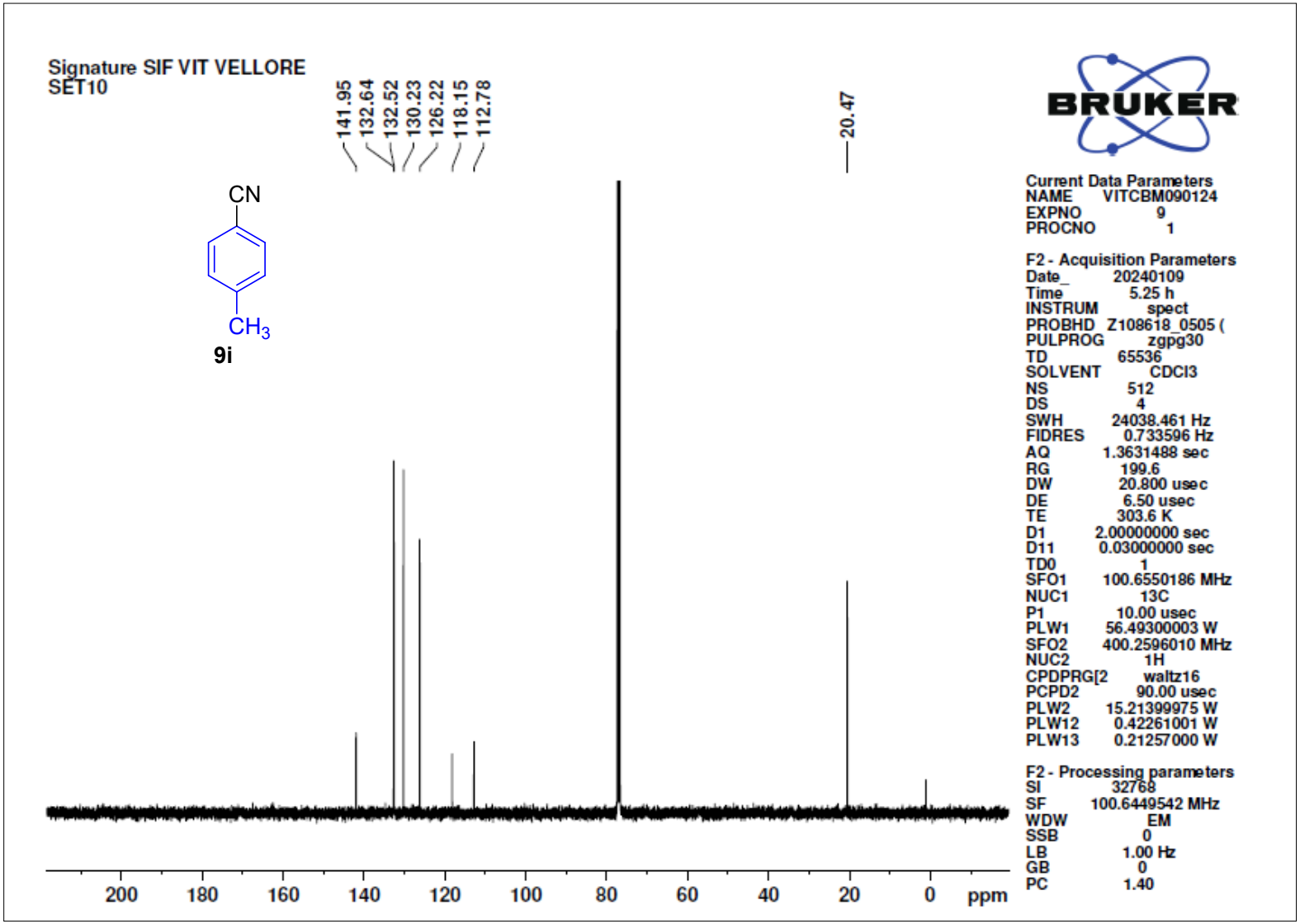

Figure 100: ^{13}C NMR spectrum of the compound **9i**.

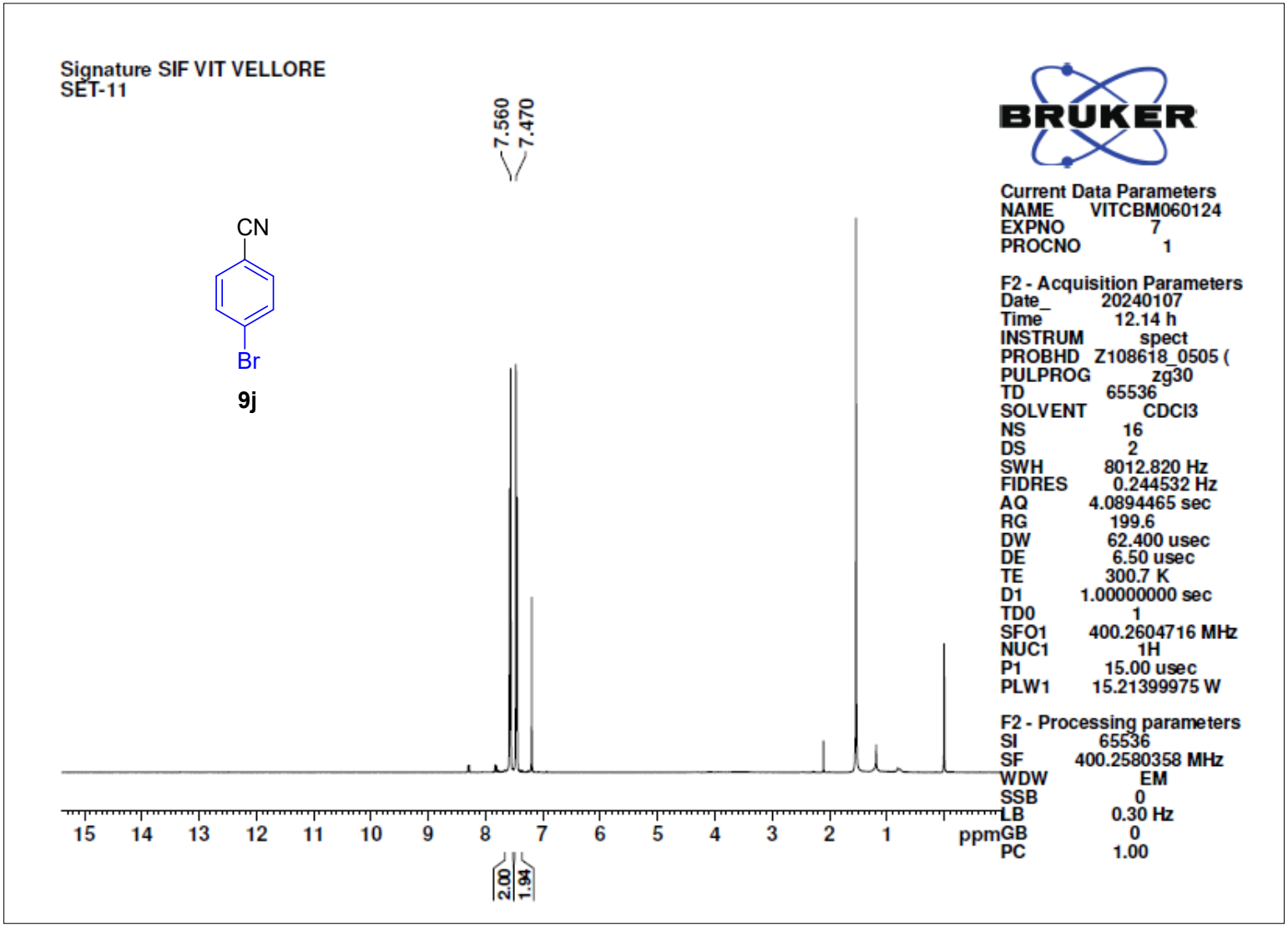

Figure 101: ^{1}H NMR spectrum of the compound **9j.**

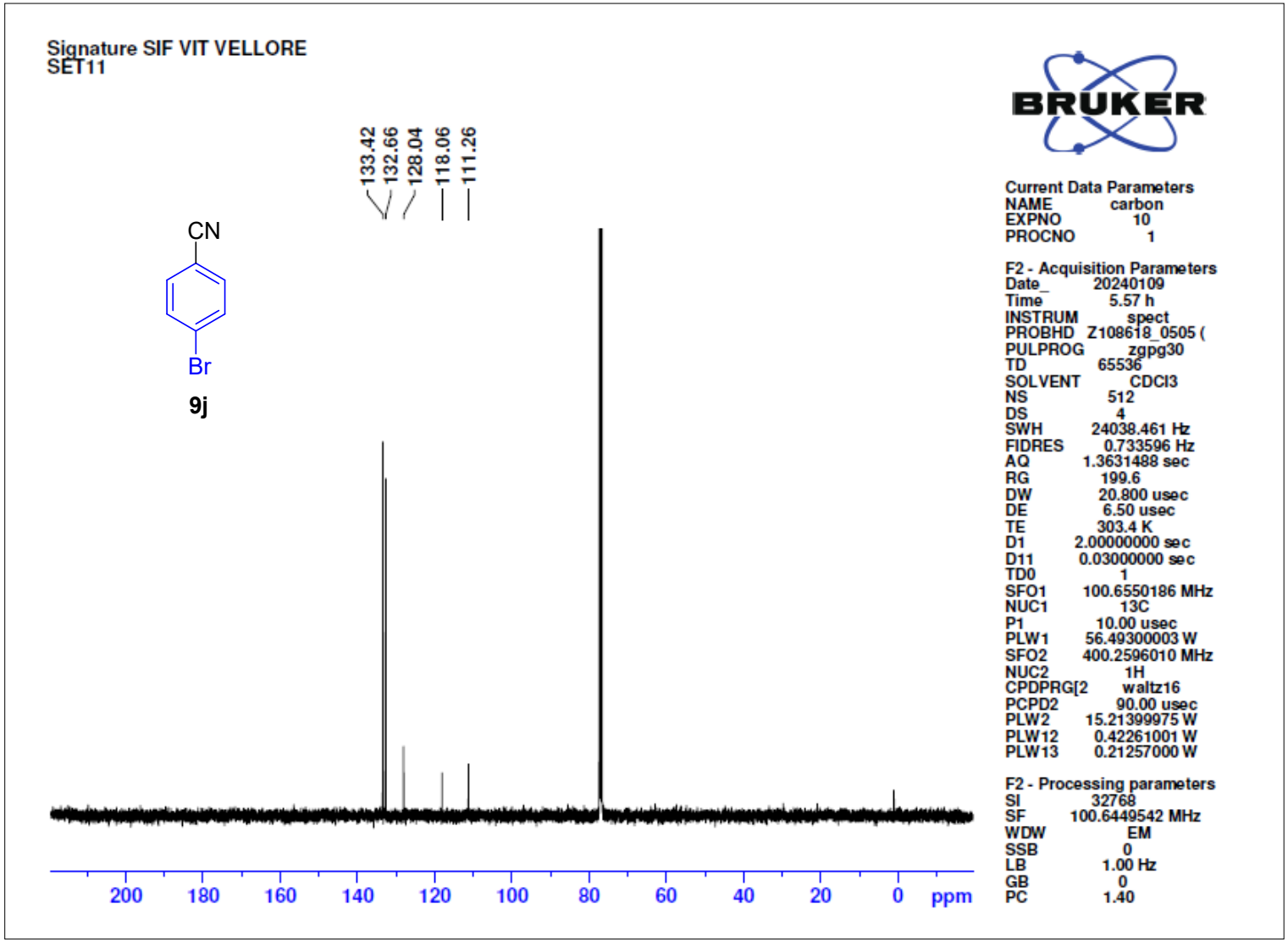

Figure 102: ^{13}C NMR spectrum of the compound **9j**.

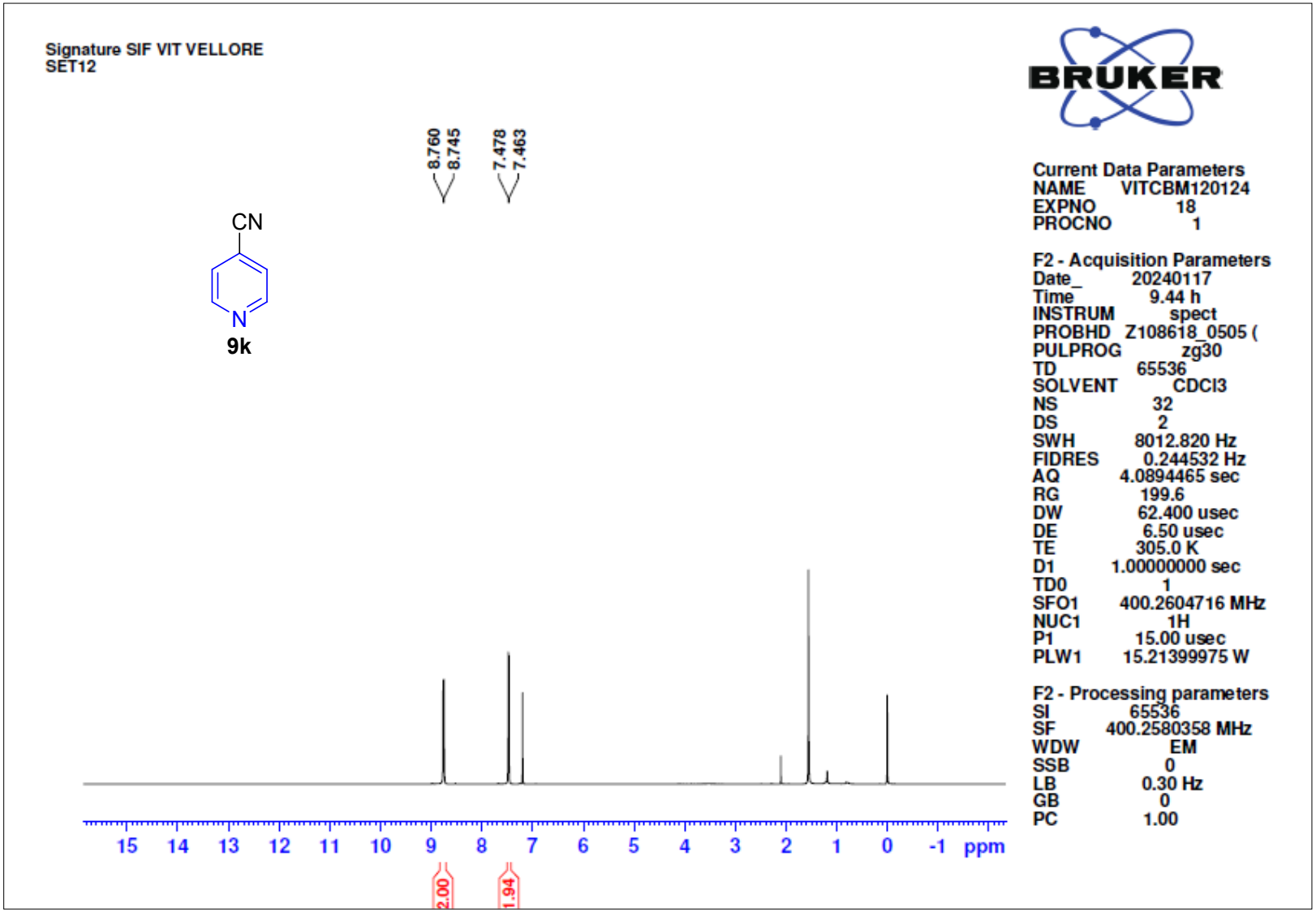

Figure 103: [1]H NMR spectrum of the compound **9k.**

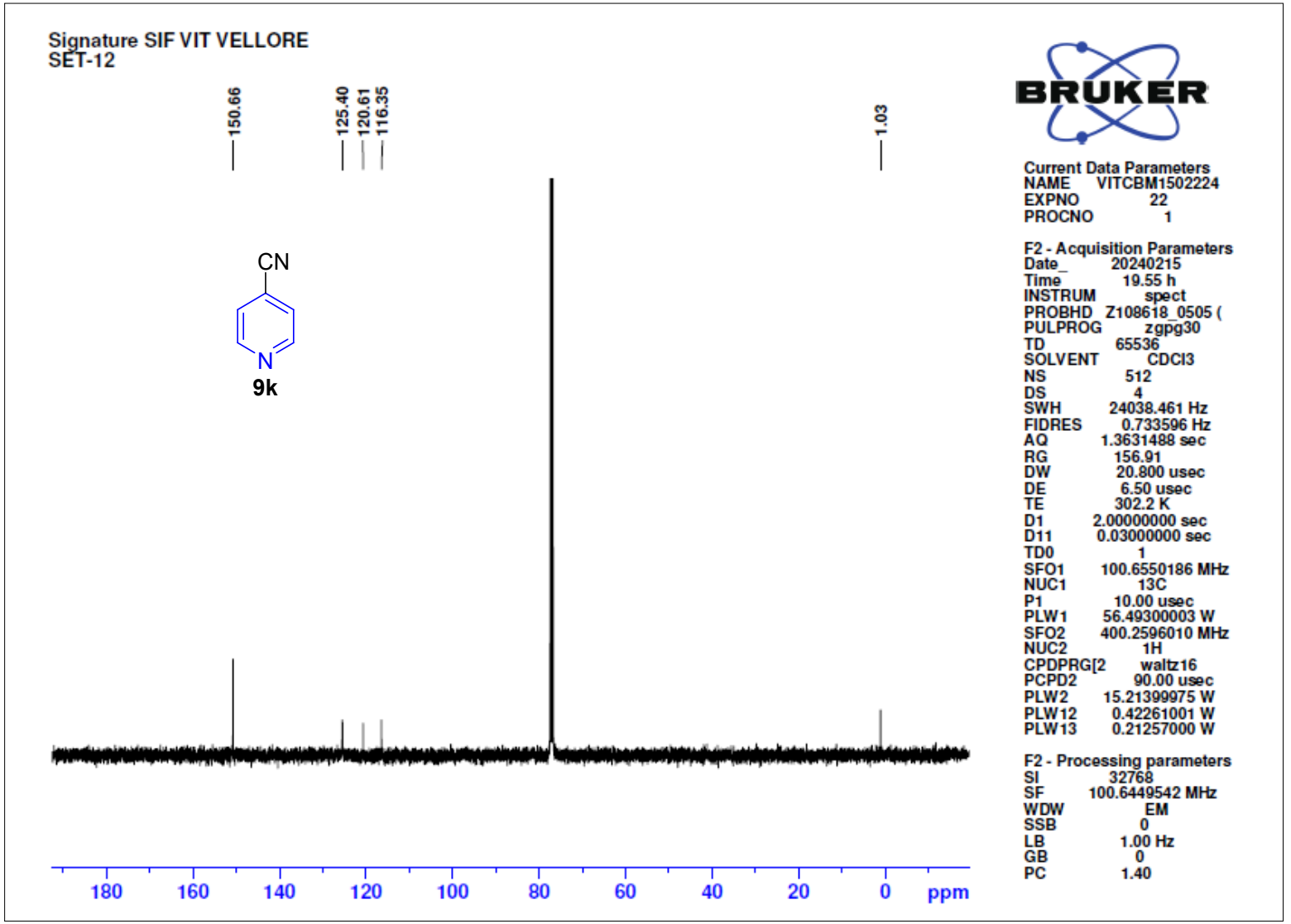

Figure 104: ^{13}C NMR spectrum of the compound **9k**.

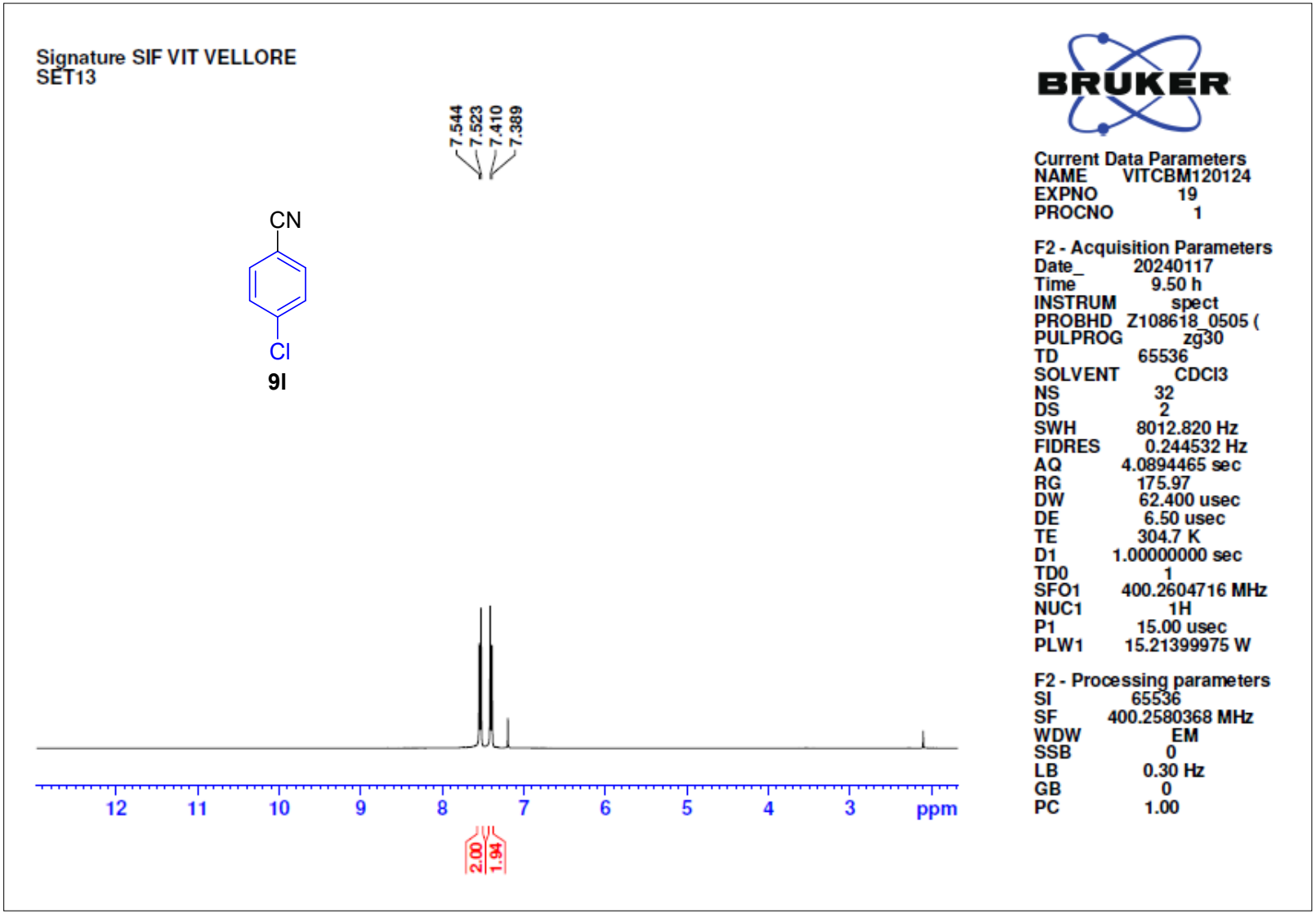

Figure 105: ^{1}H NMR spectrum of the compound **9l.**

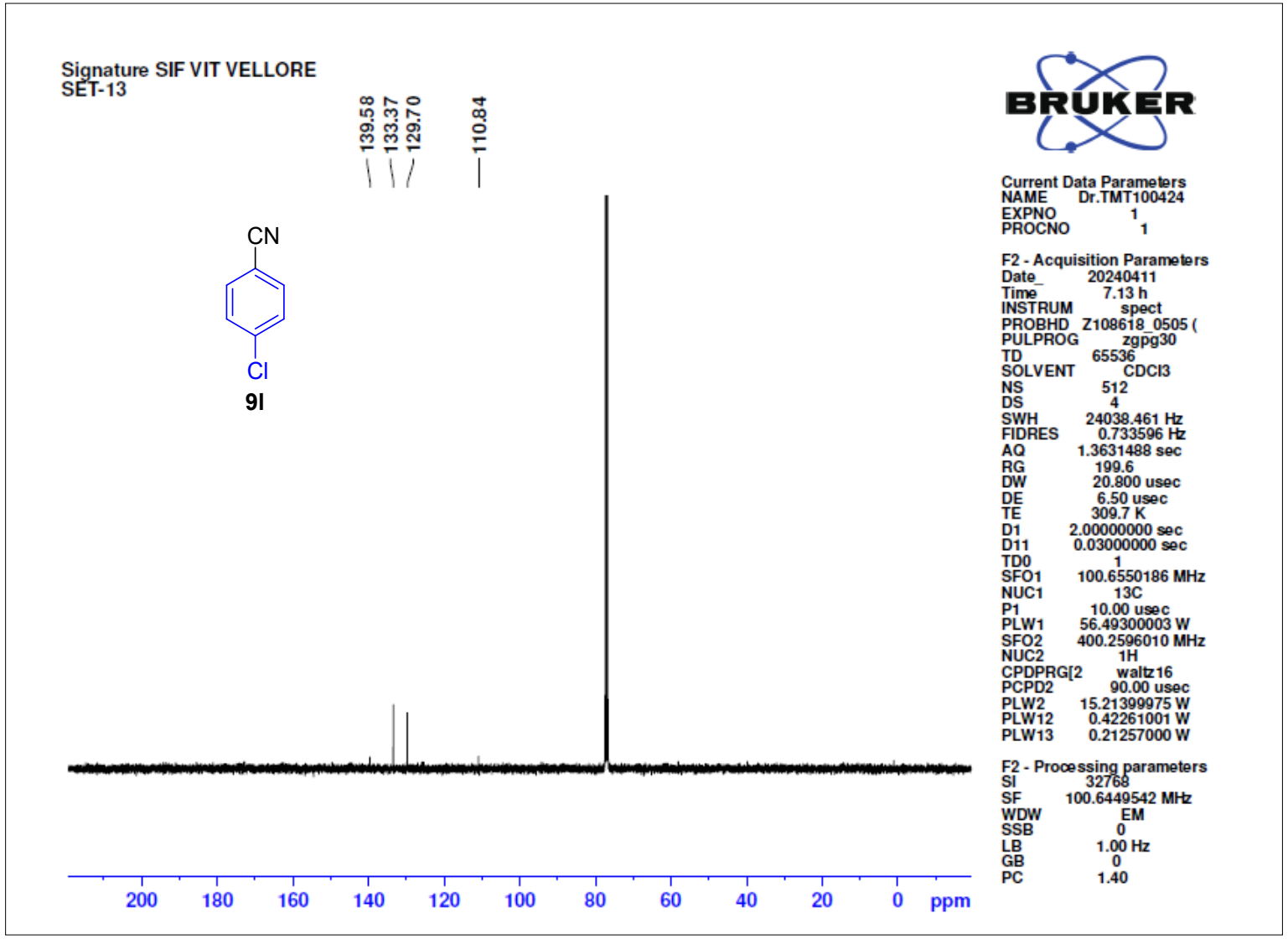

Figure 106: ^{13}C NMR spectrum of the compound **9l**.

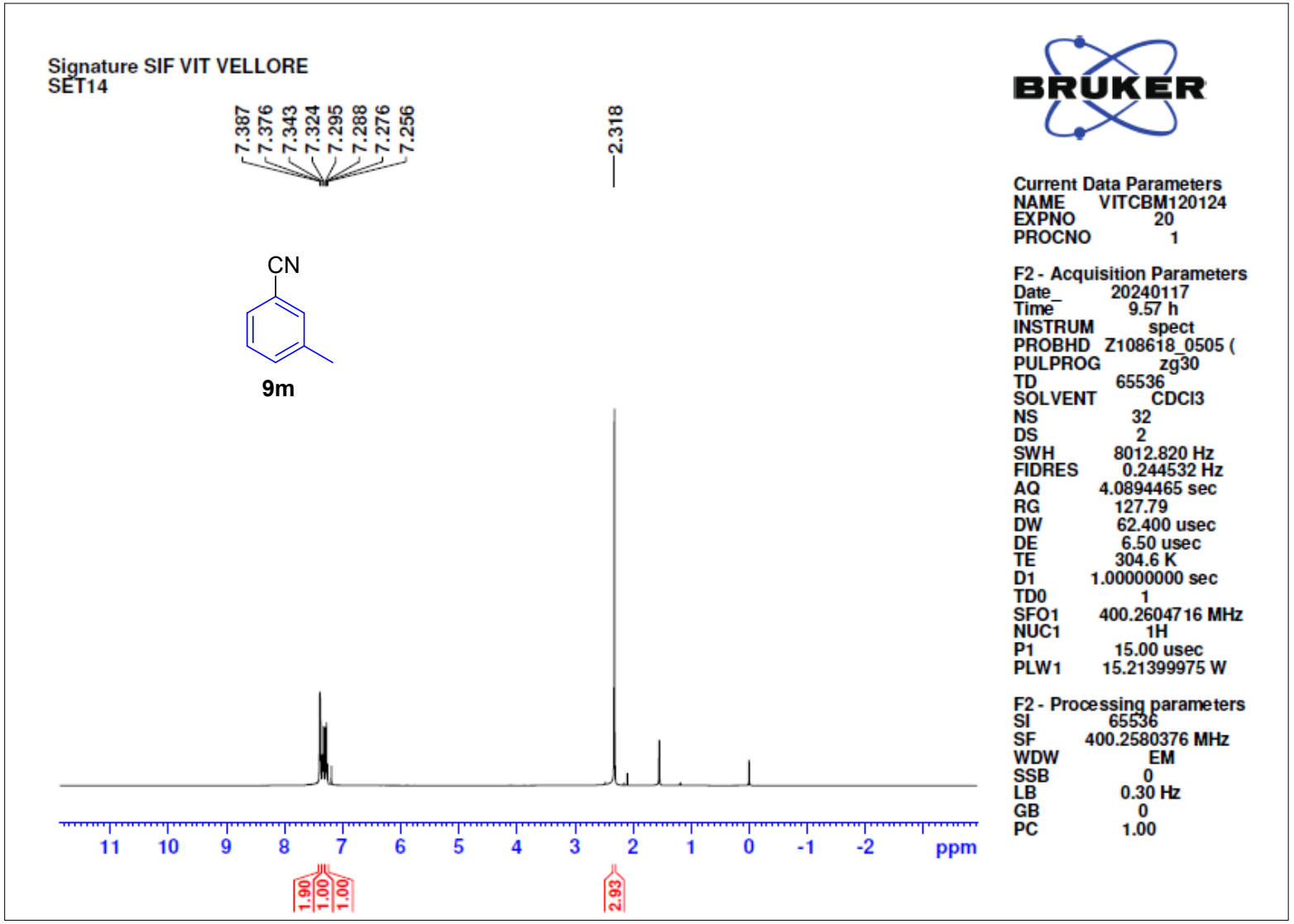

Figure 107: ^{1}H NMR spectrum of the compound **9m.**

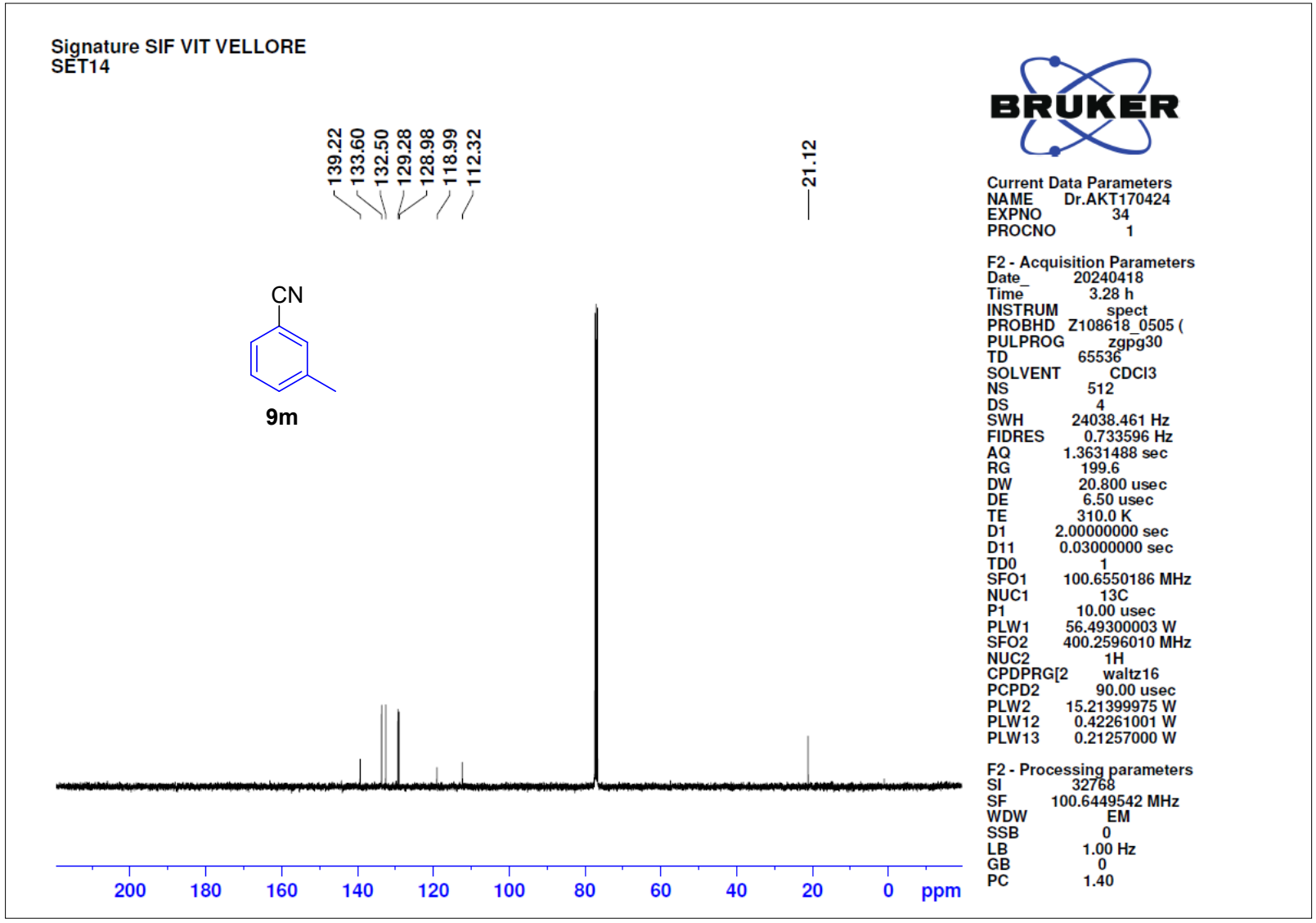

Figure 108: ^{13}C NMR spectrum of the compound **9m**.

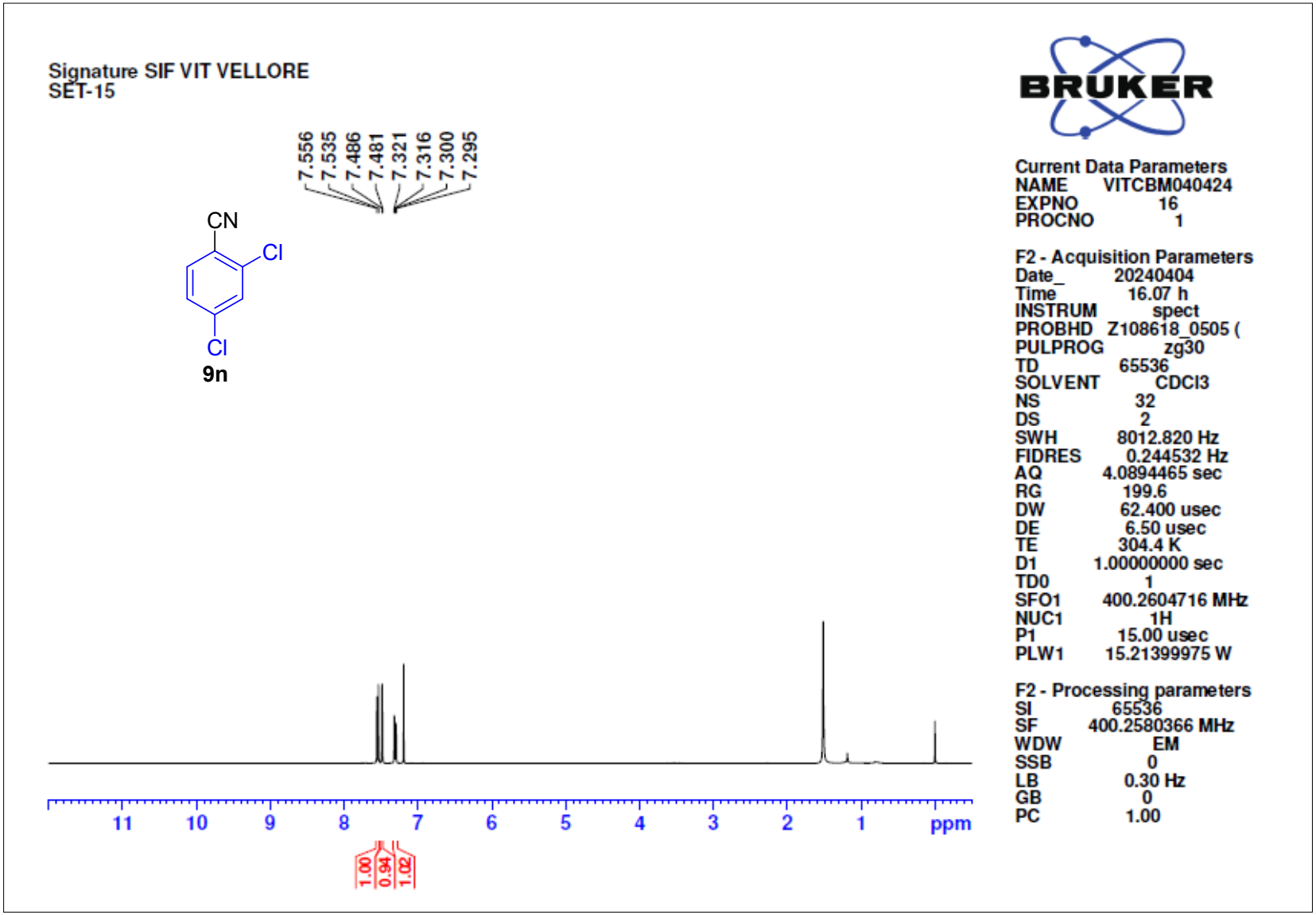

Figure 109: ^{1}H NMR spectrum of the compound **9n.**

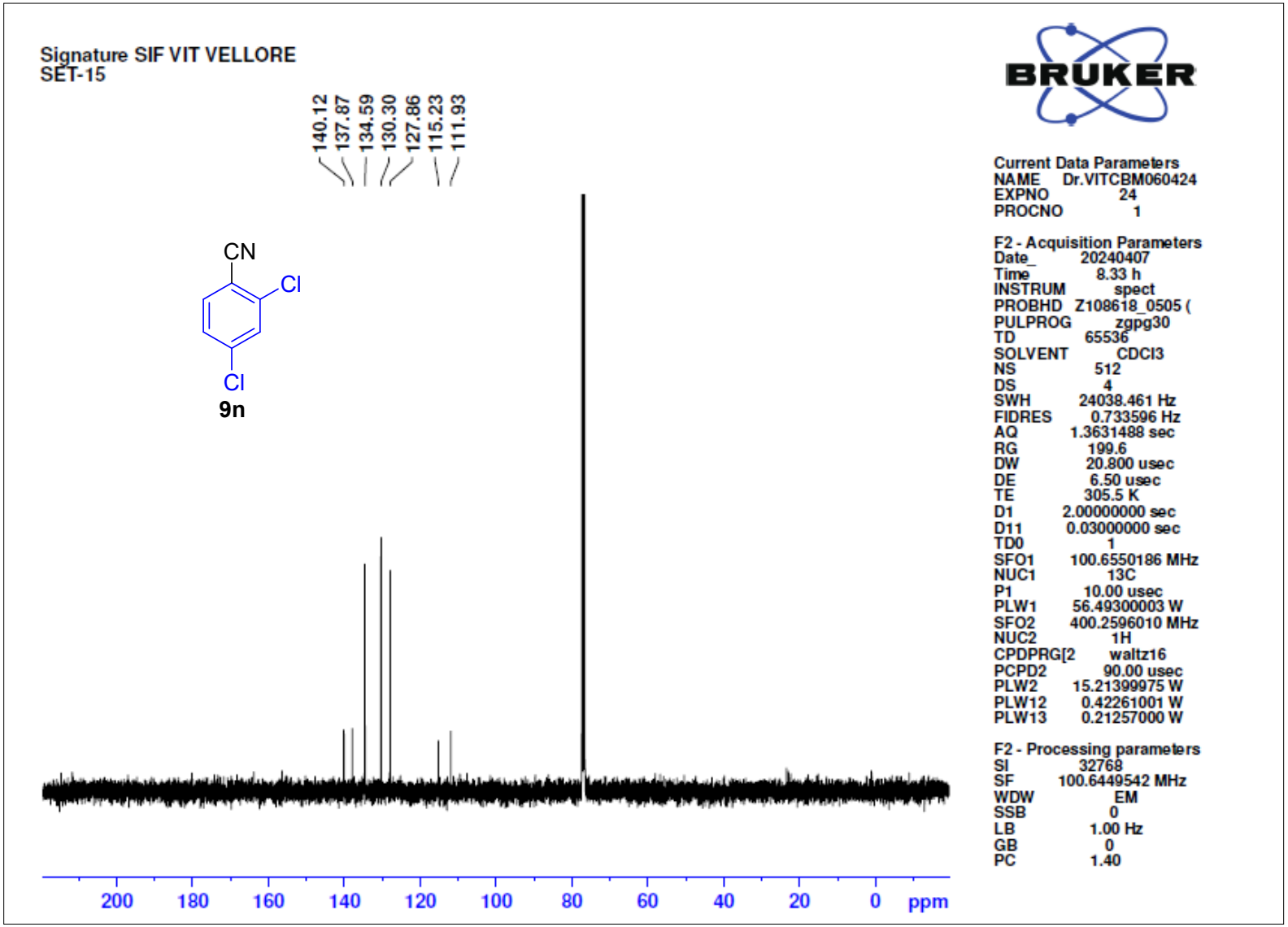

Figure 110: ^{13}C NMR spectrum of the compound **9n**.

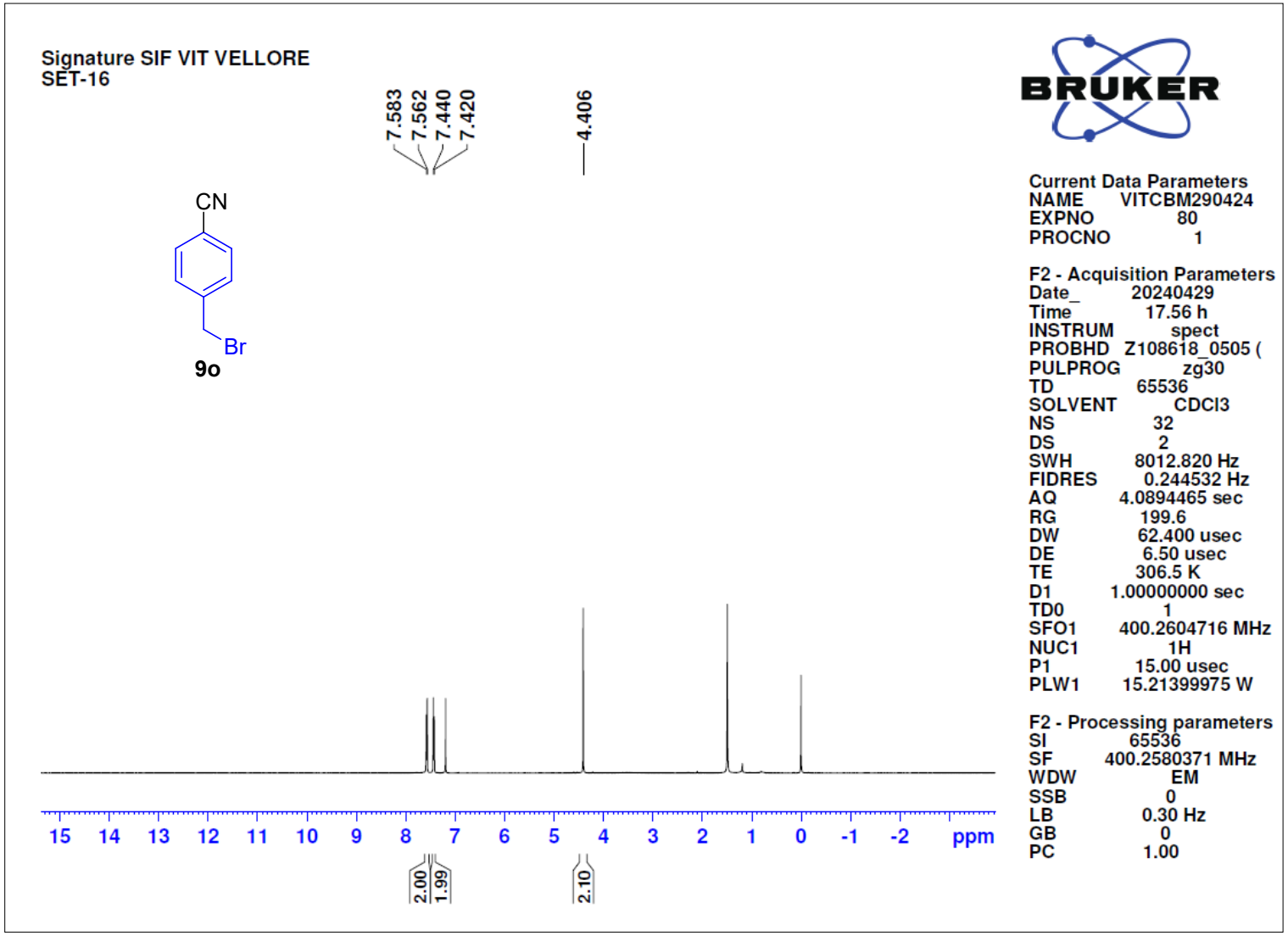

Figure 111: ^{1}H NMR spectrum of the compound **9o.**

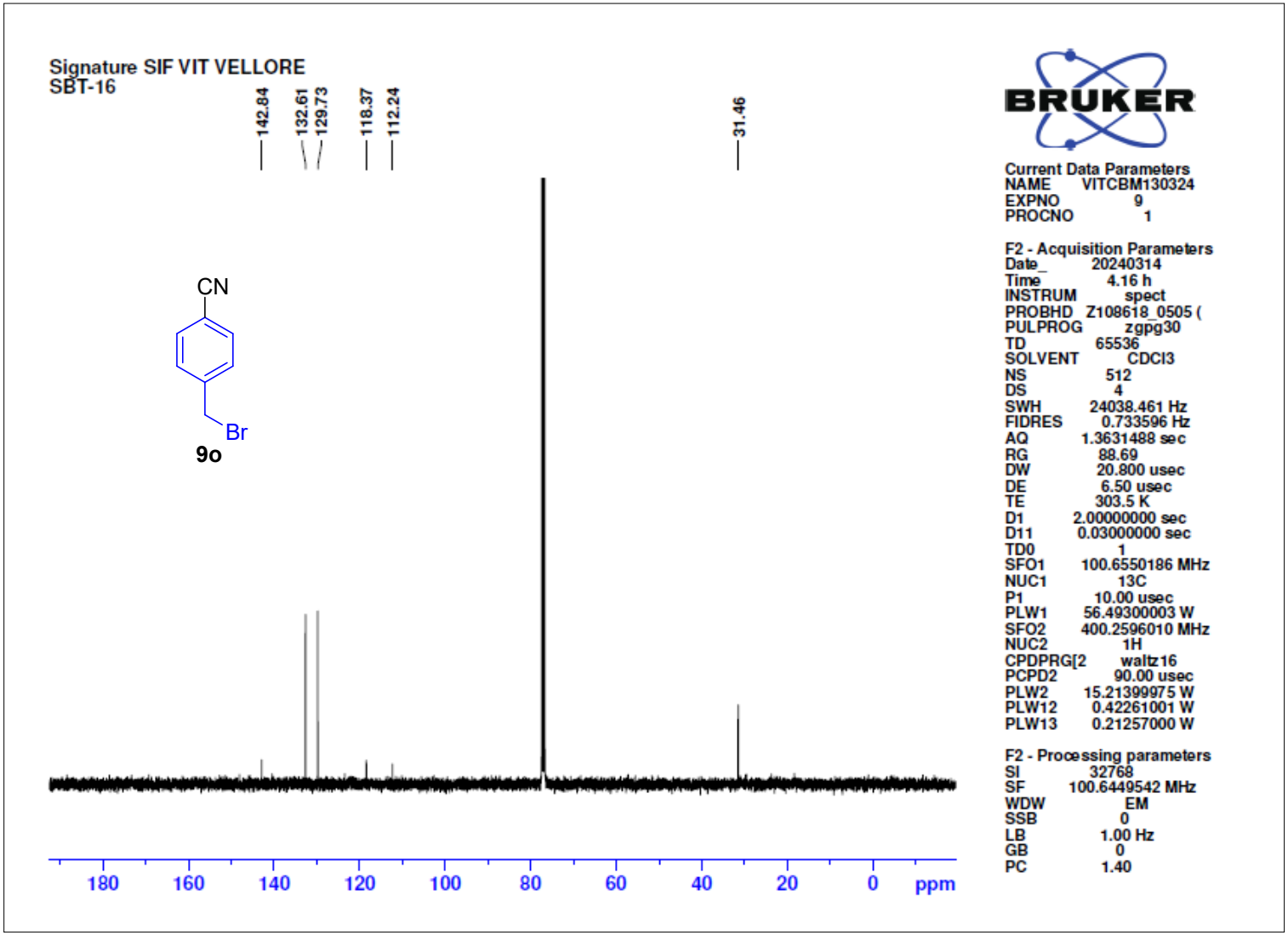

Figure 112: ^{13}C NMR spectrum of the compound **9o**.

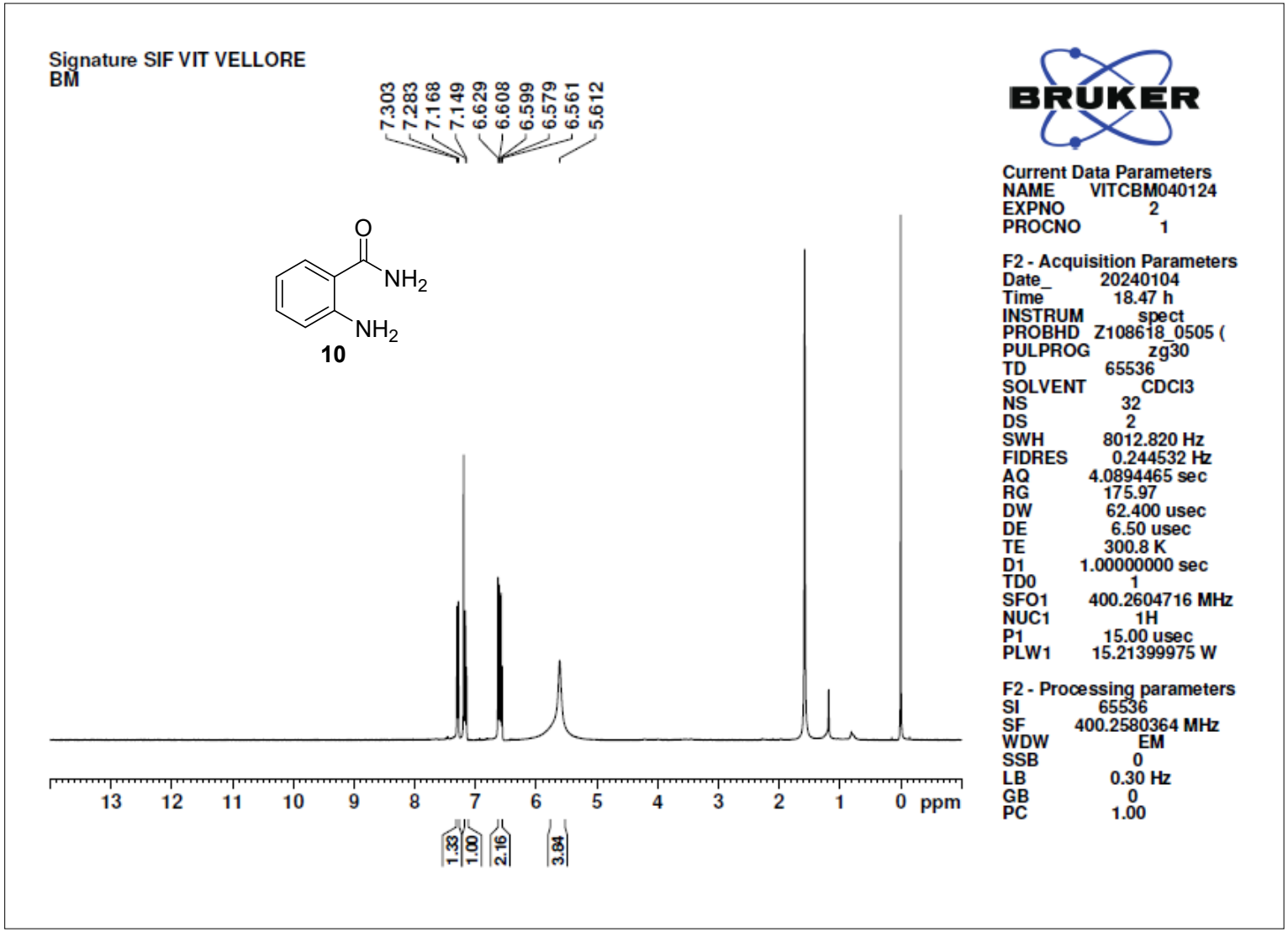

Figure 113: ^{1}H NMR spectrum of the compound **10.**

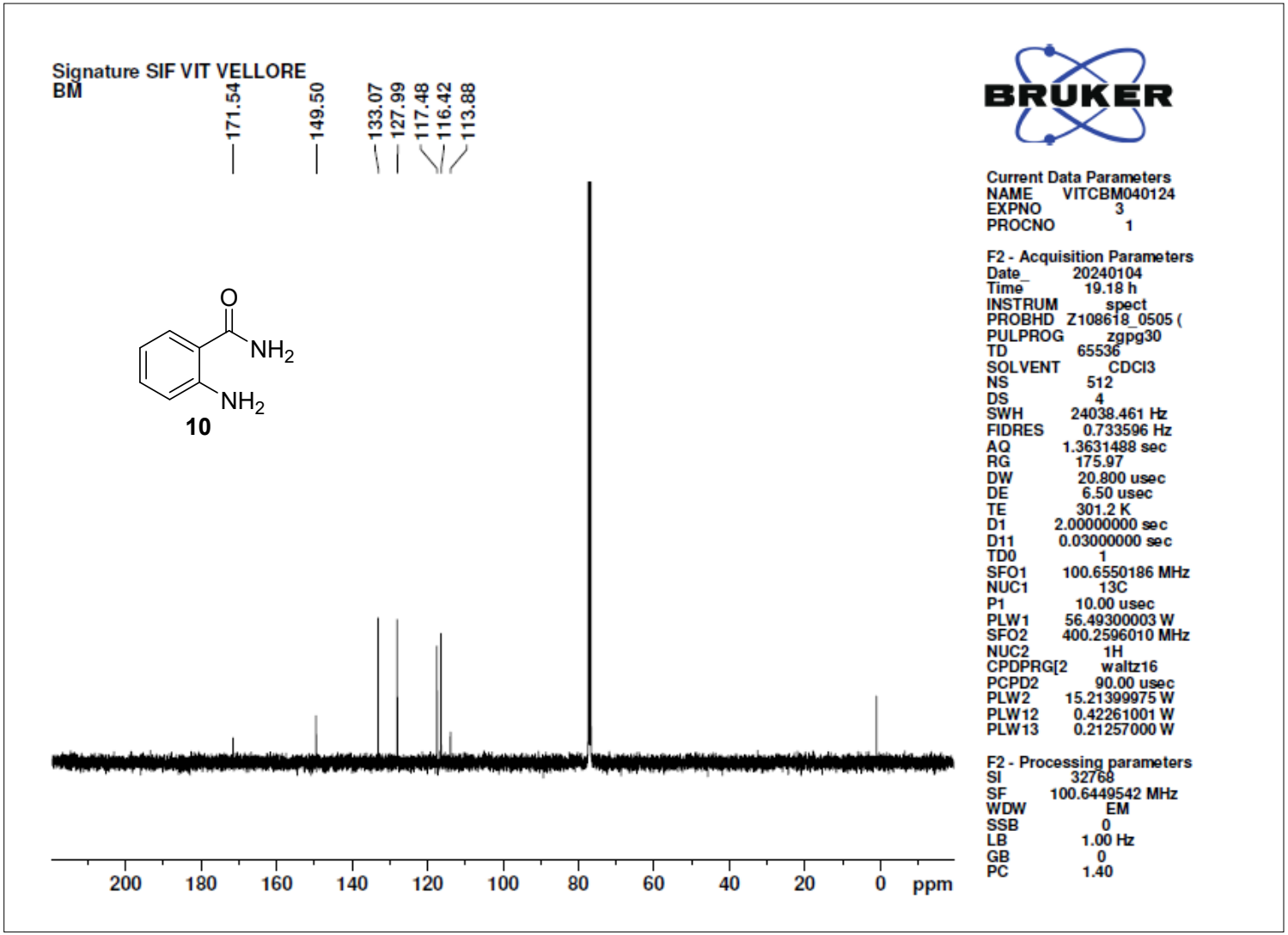

Figure 114: ^{13}C NMR spectrum of the compound **10**.

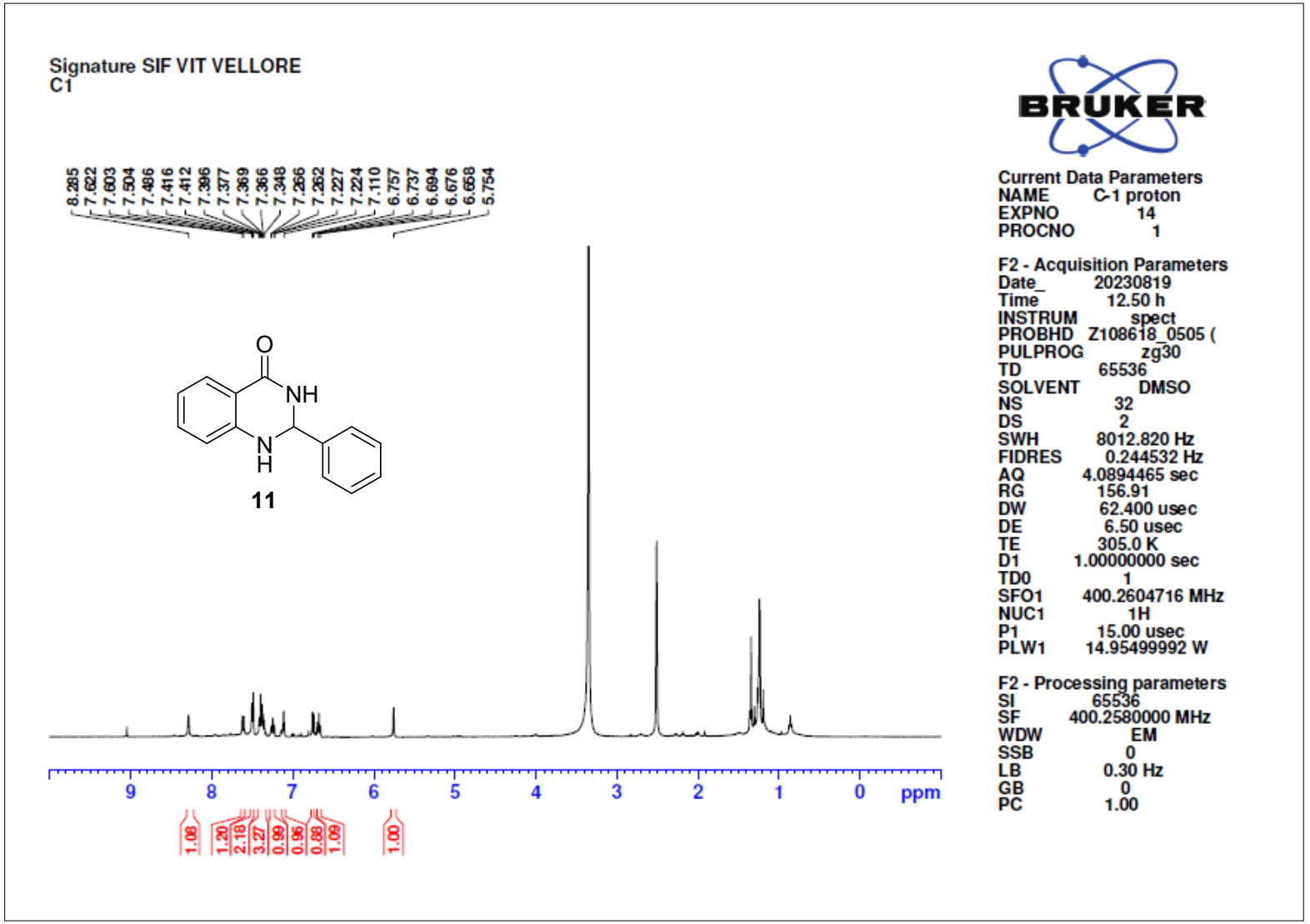

Figure 115: ^{1}H NMR spectrum of the compound **11.**

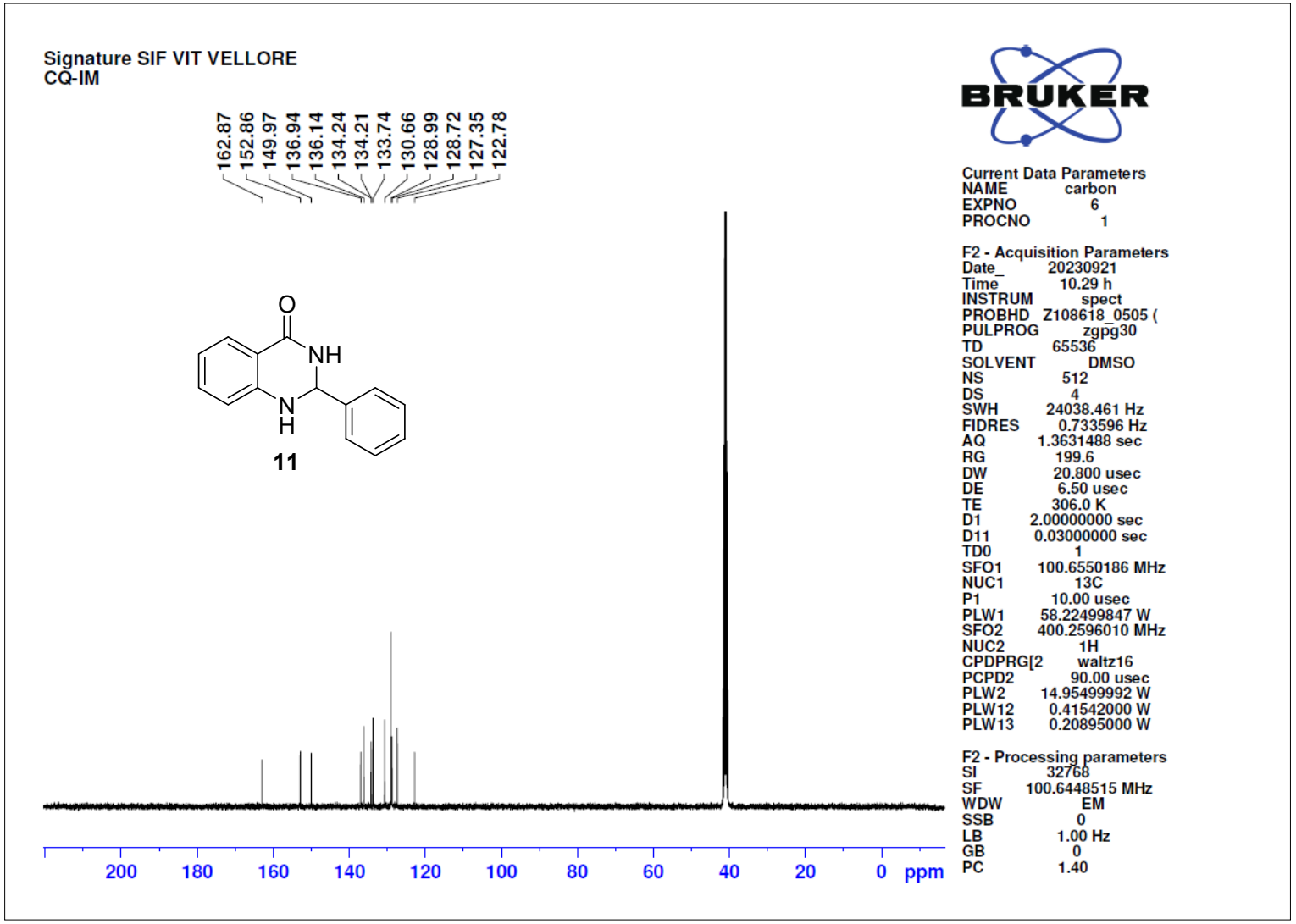

Figure 116: ^{13}C NMR spectrum of the compound **11**.

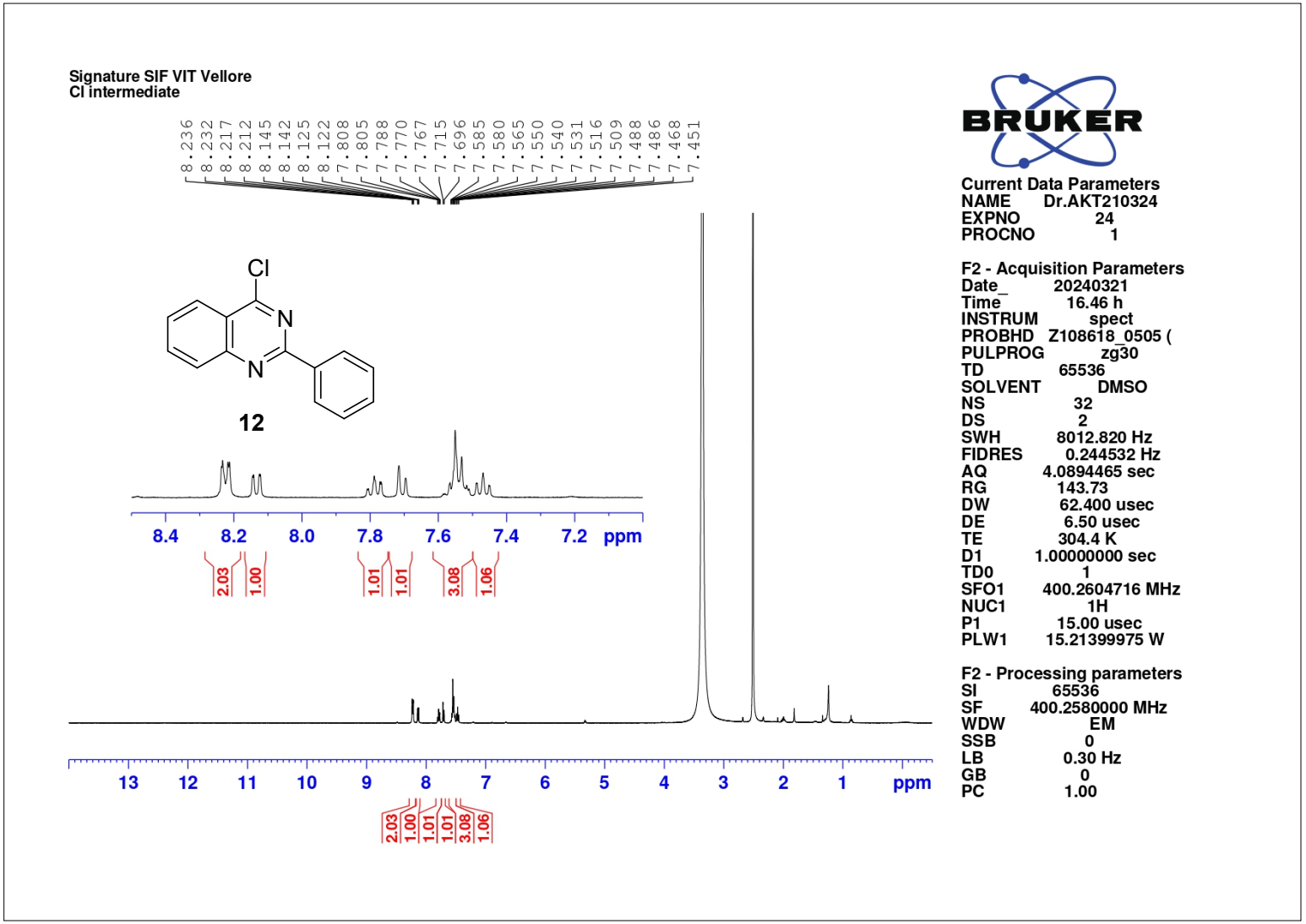

Figure 117: ^{1}H NMR spectrum of the compound **12.**

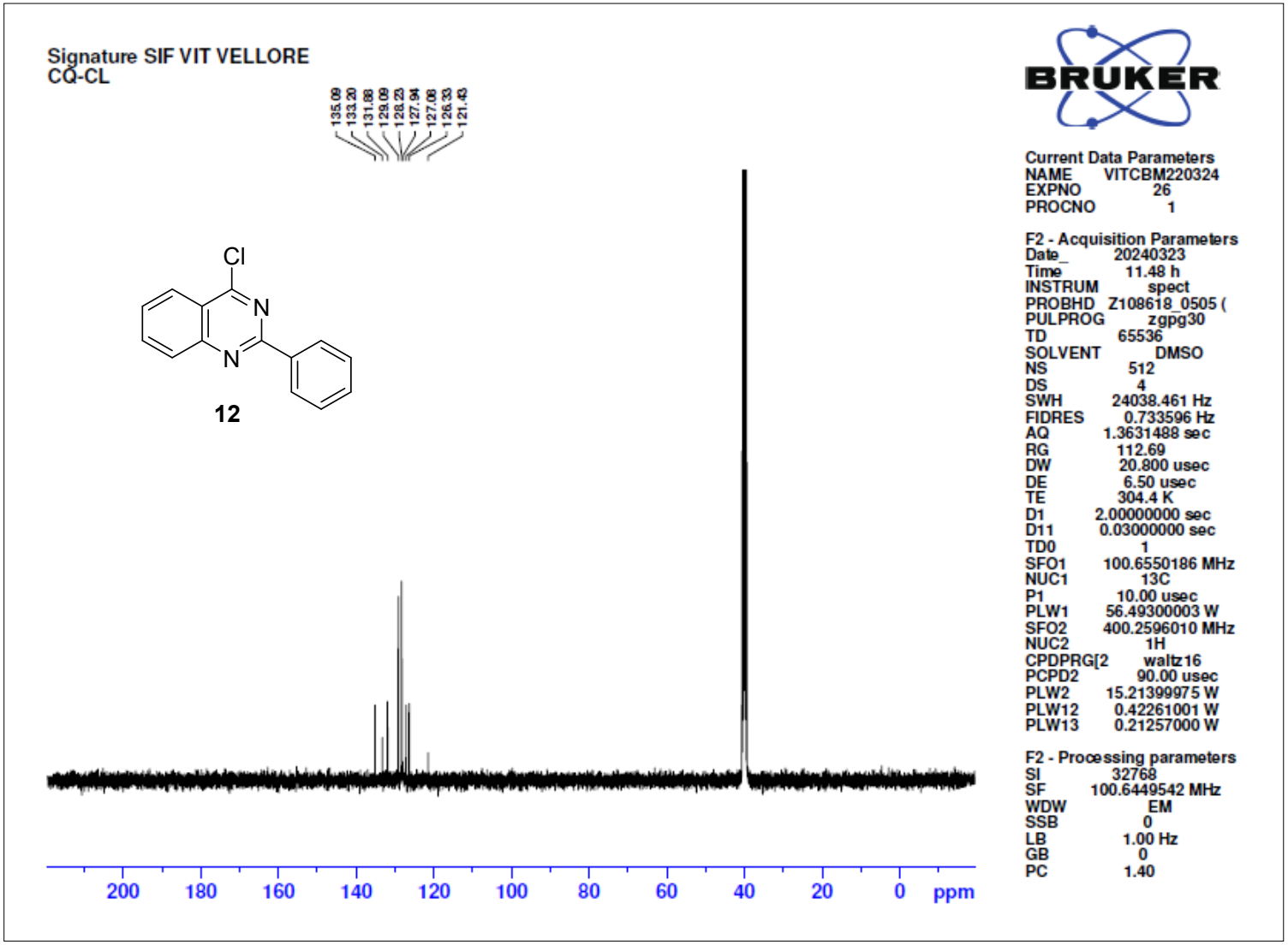

Figure 118: ^{13}C NMR spectrum of the compound **12**.

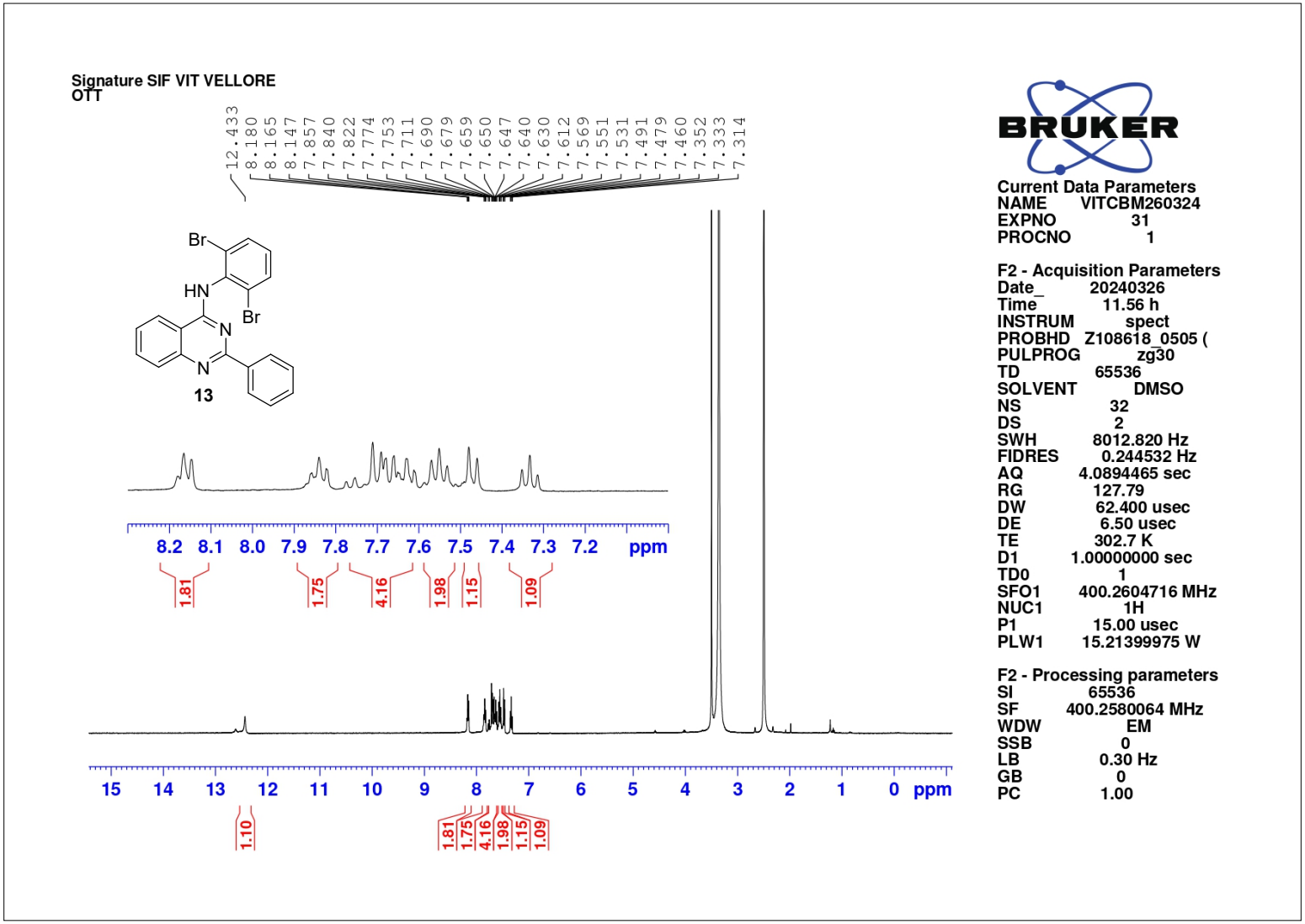

Figure 119: ^{1}H NMR spectrum of the compound **13.**

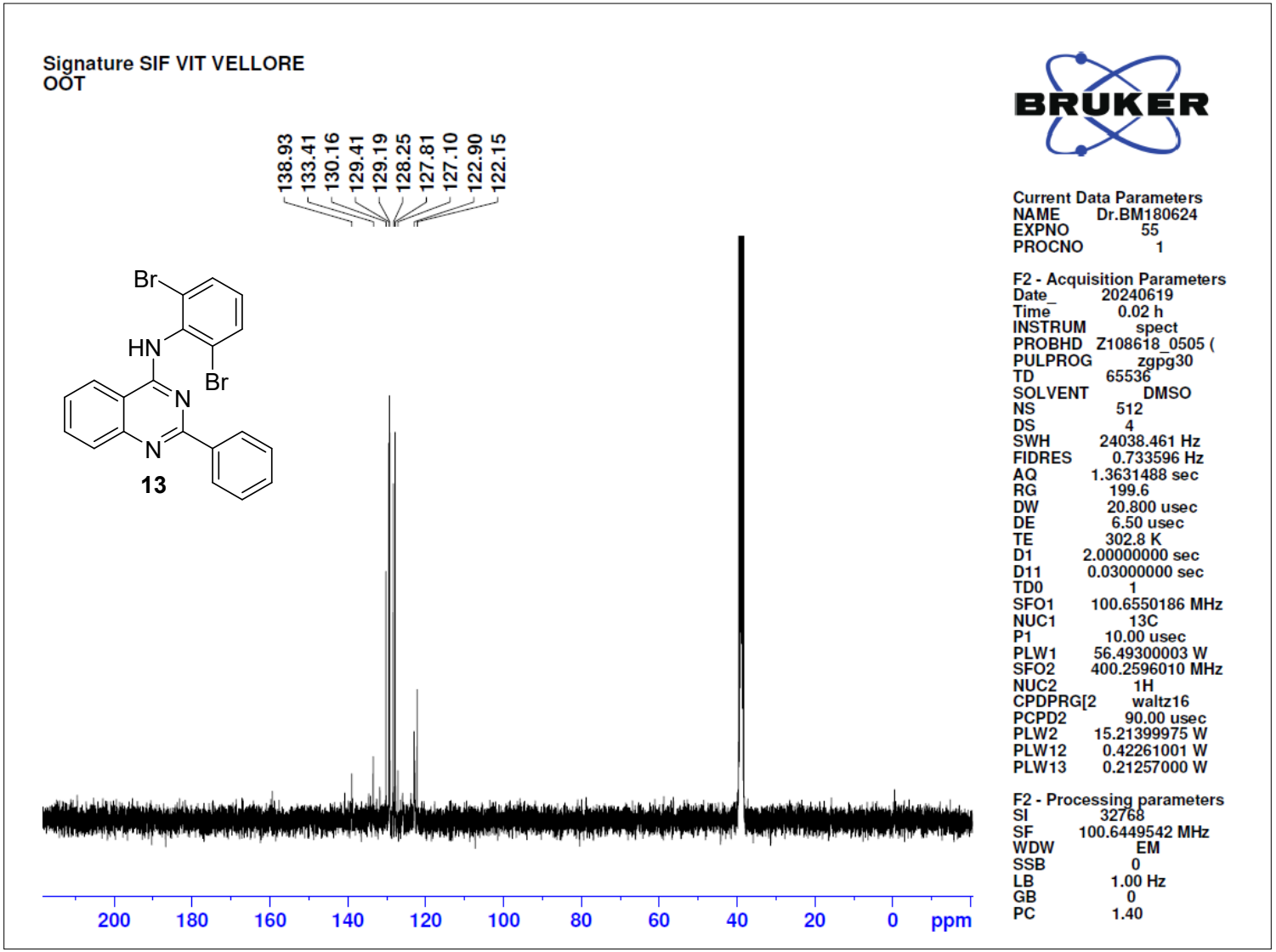

Figure 120: ^{13}C NMR spectrum of the compound **13**.

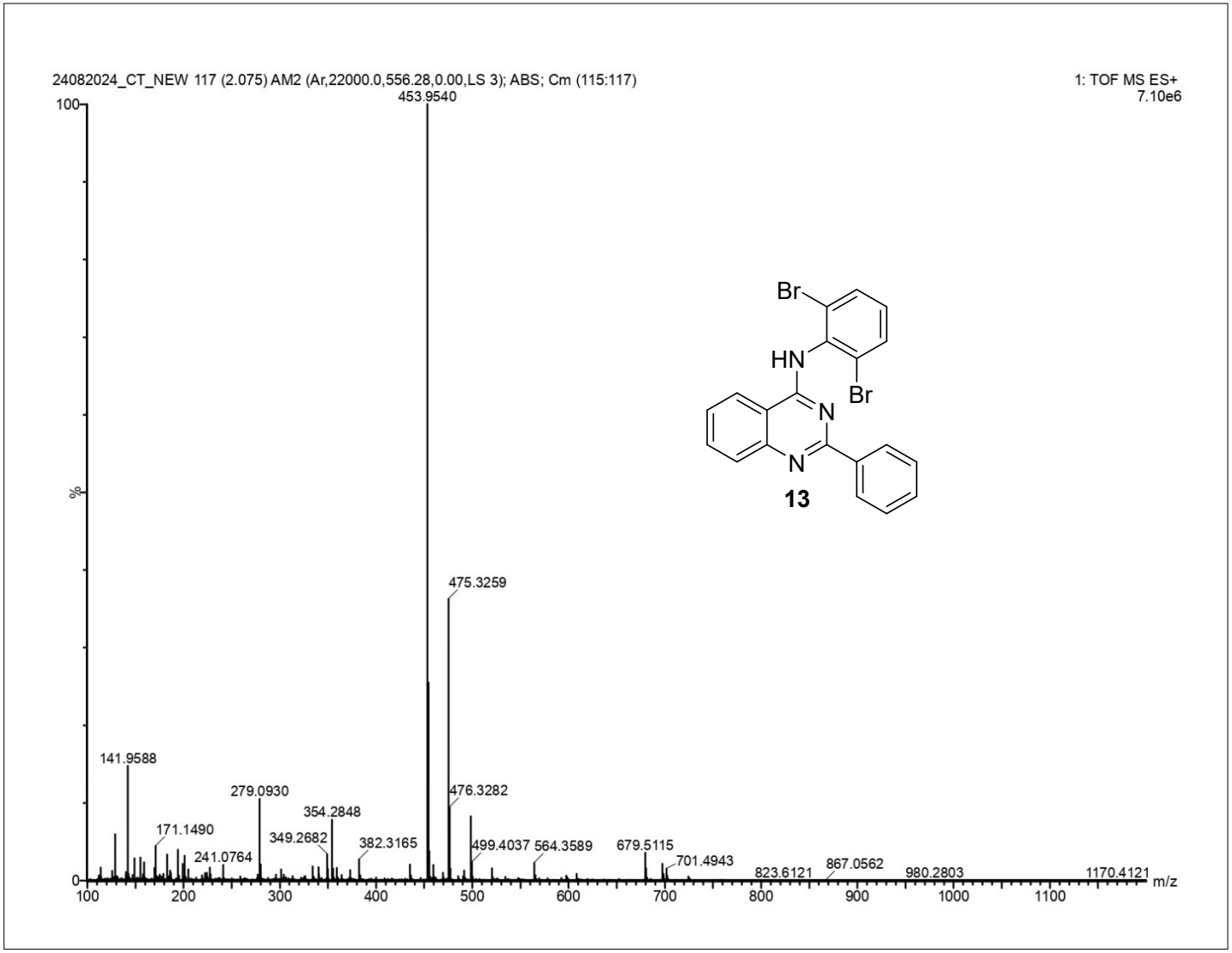

Fig 121: HRMS of the compound **13.**

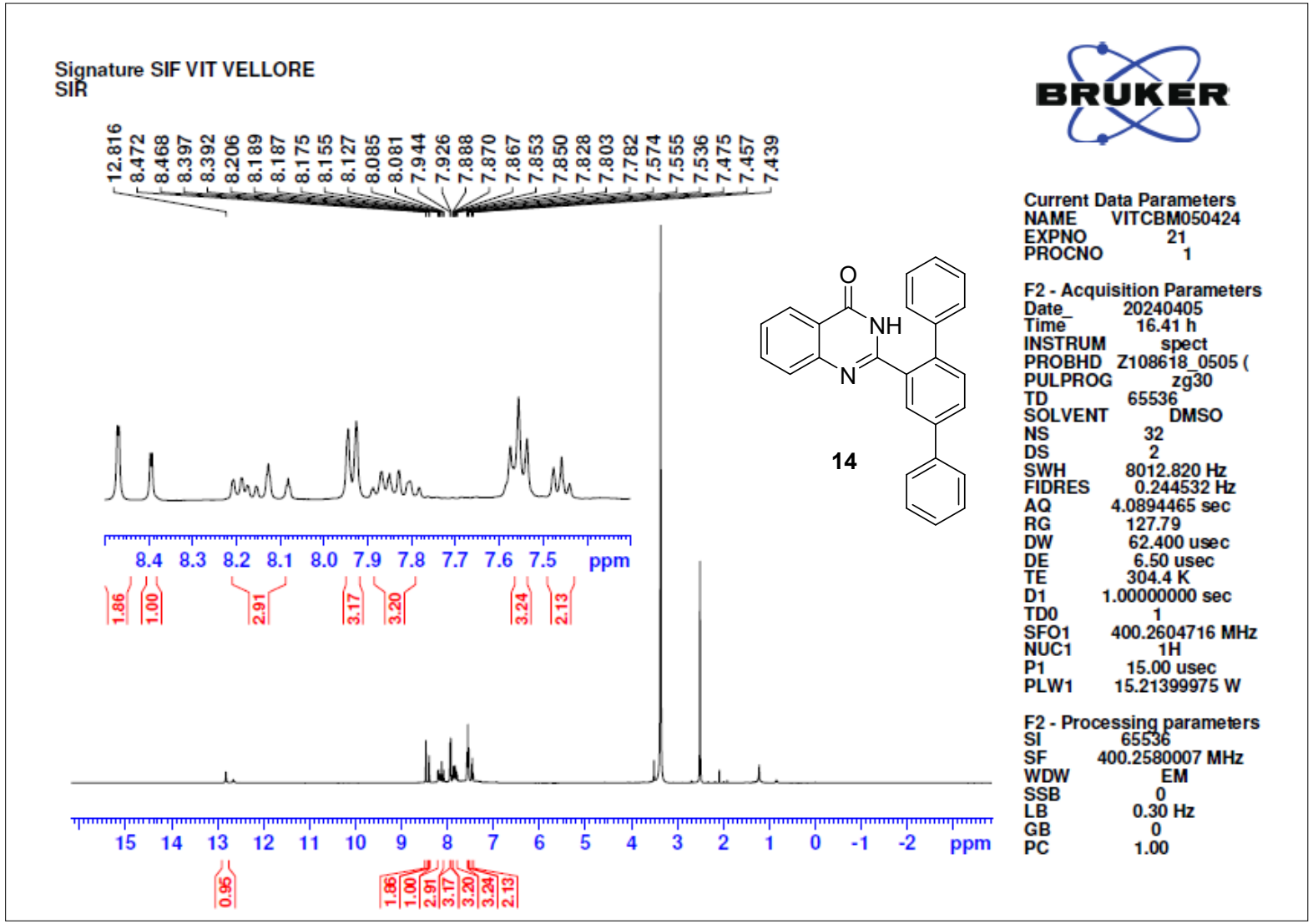

Figure 122: ^{1}H NMR spectrum of the compound **14.**

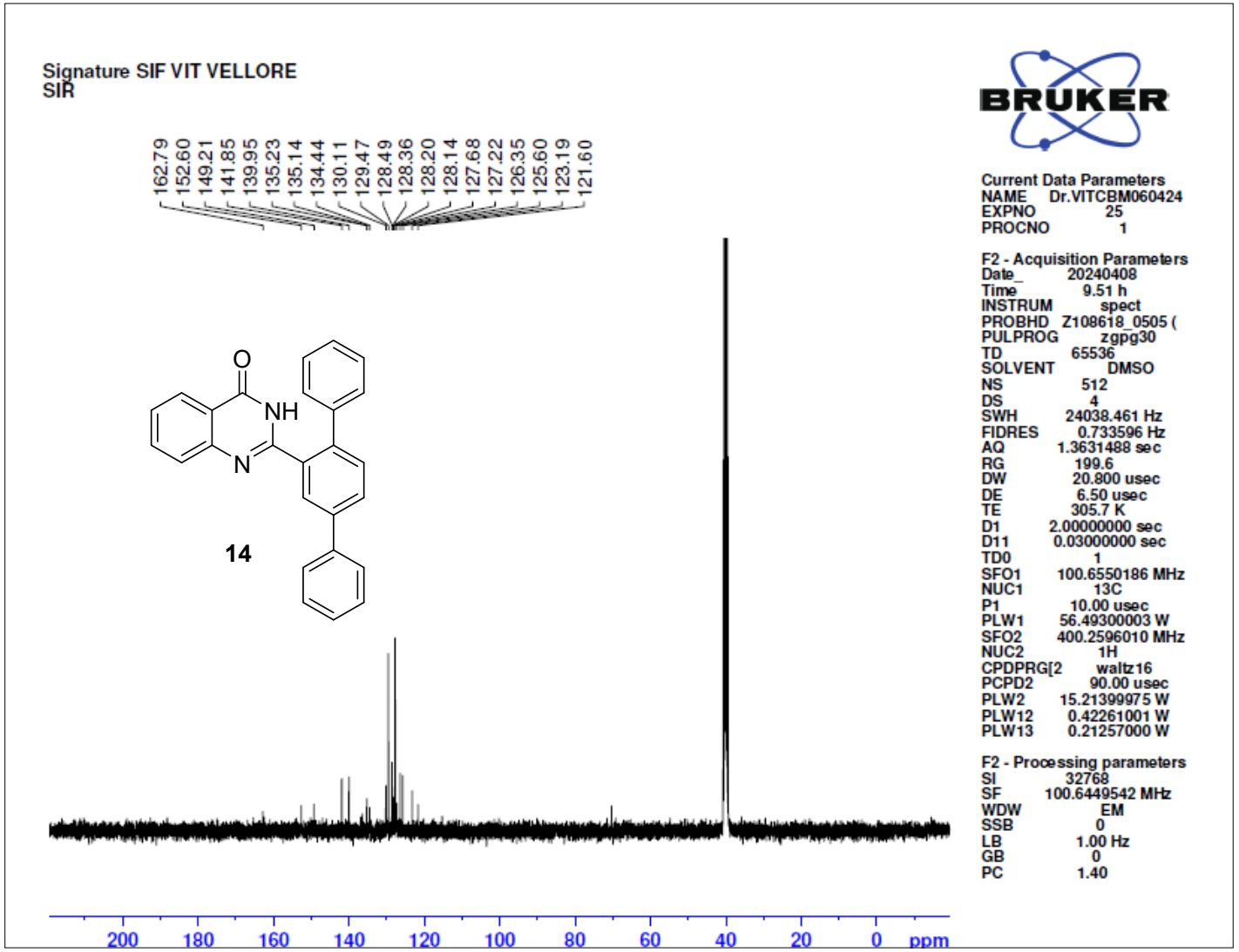

Figure 123: ^{13}C NMR spectrum of the compound **14**.

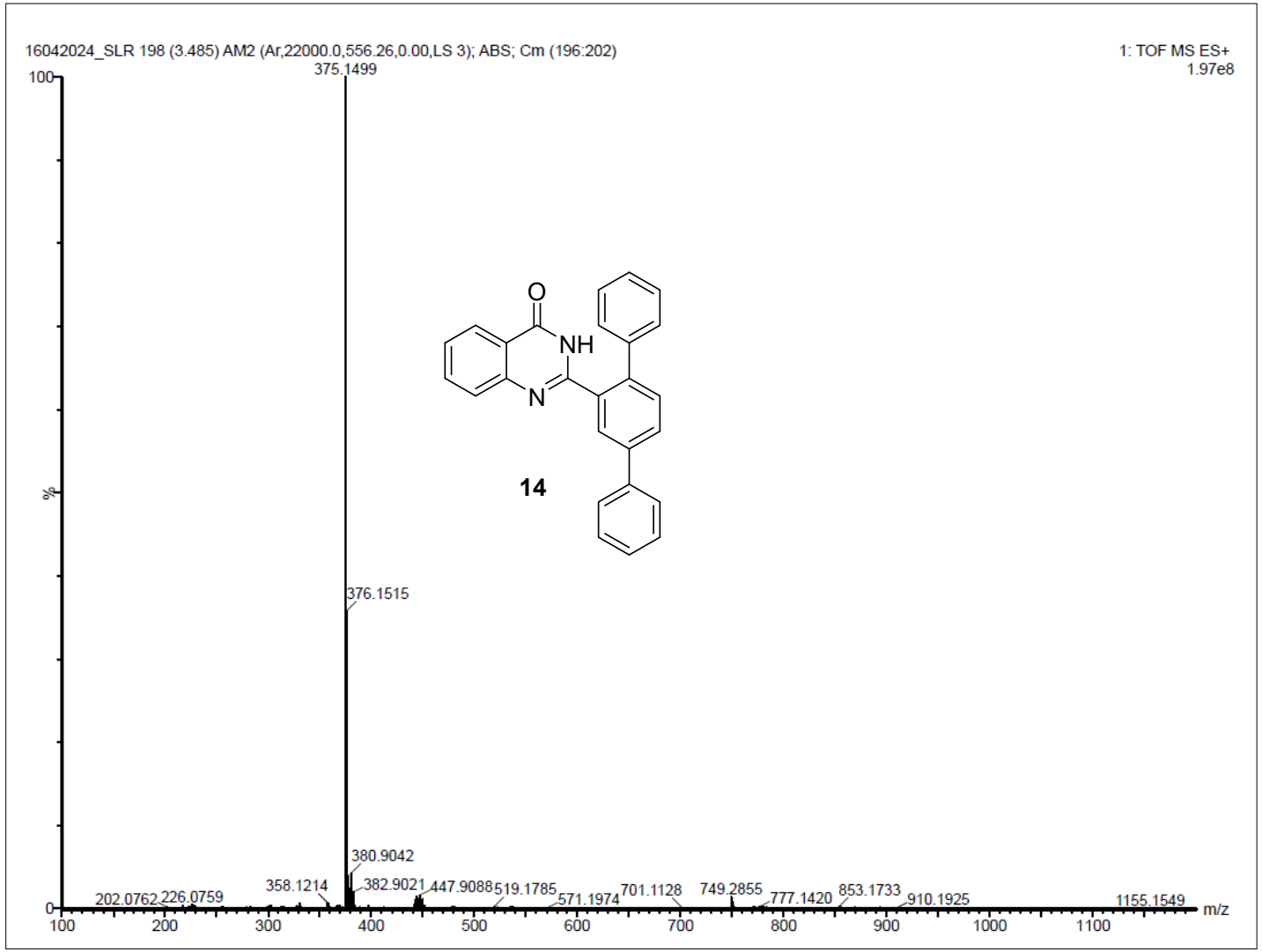

Figure 124: HRMS of the compound **14**.