

Supporting Information

An efficient synthesis of new imidazo[1,2-*a*]pyridine-6-carbohydrazide and pyrido[1,2-*a*]pyrimidine-7-carbohydrazide derivatives *via* a five-component cascade reaction

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Experimental Section

General remarks:

Melting points were measured on an Electrothermal 9100 apparatus. Mass spectra were recorded with an Agilent 5975C VL MSD with Triple-Axis Detector operating at an ionization potential of 70 eV. ¹H and ¹³C NMR spectra were measured (DMSO) with a Bruker DRX-300 AVANCE spectrometer at 300 and 75 MHz, respectively. IR spectra were recorded on a Bruker Tensor 27, $\tilde{\nu}$ in cm⁻¹. All NMR spectra at room temperature were determined in DMSO-*d*₆. Chemical shifts are reported in parts per million (δ) downfield from an internal tetramethylsilane reference. Coupling constants (*J* values) are reported in hertz (Hz), and spin multiplicities are indicated by the following symbols: s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet). All chemicals were purchased from Merck or Aldrich and were used without further purification.

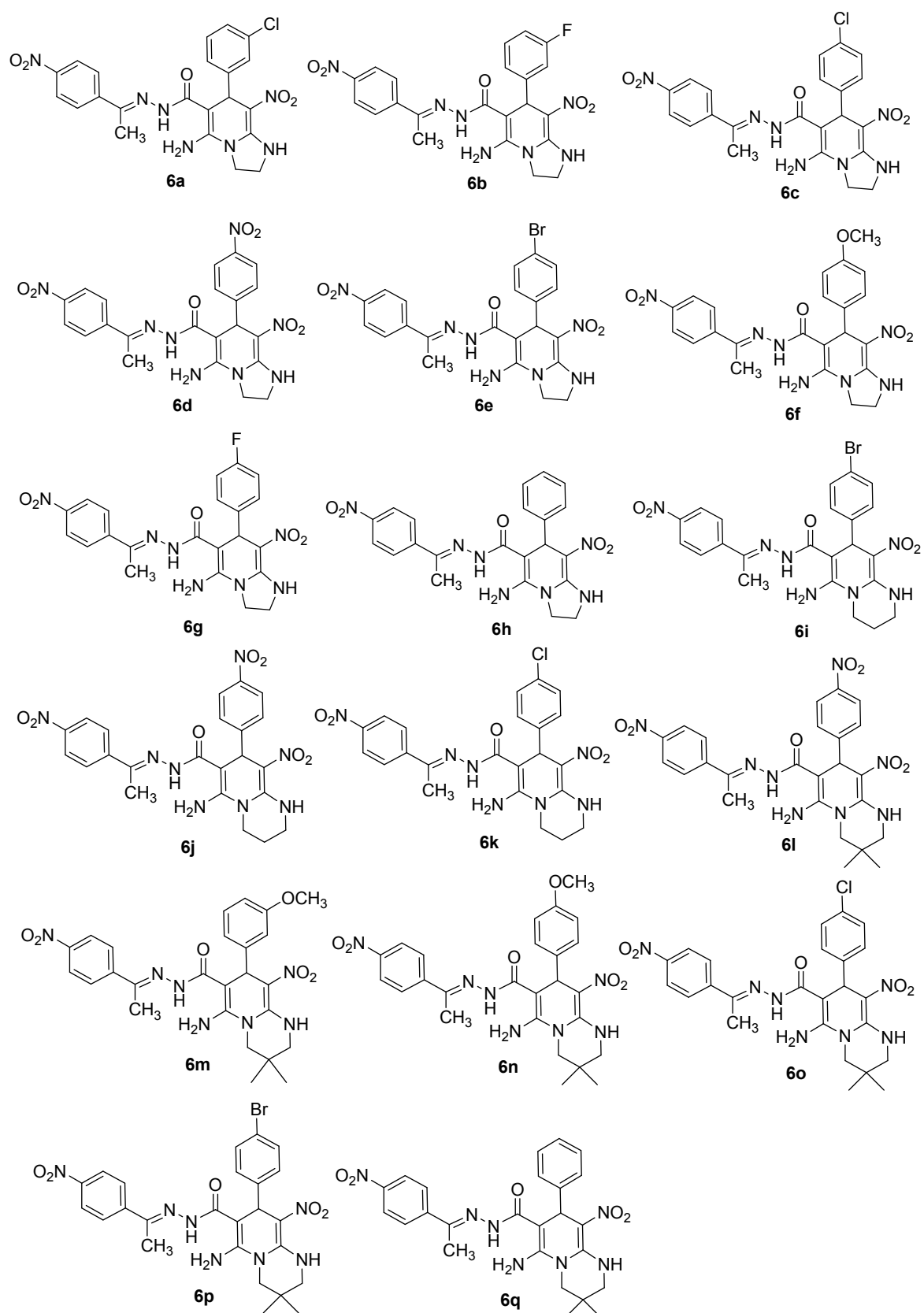
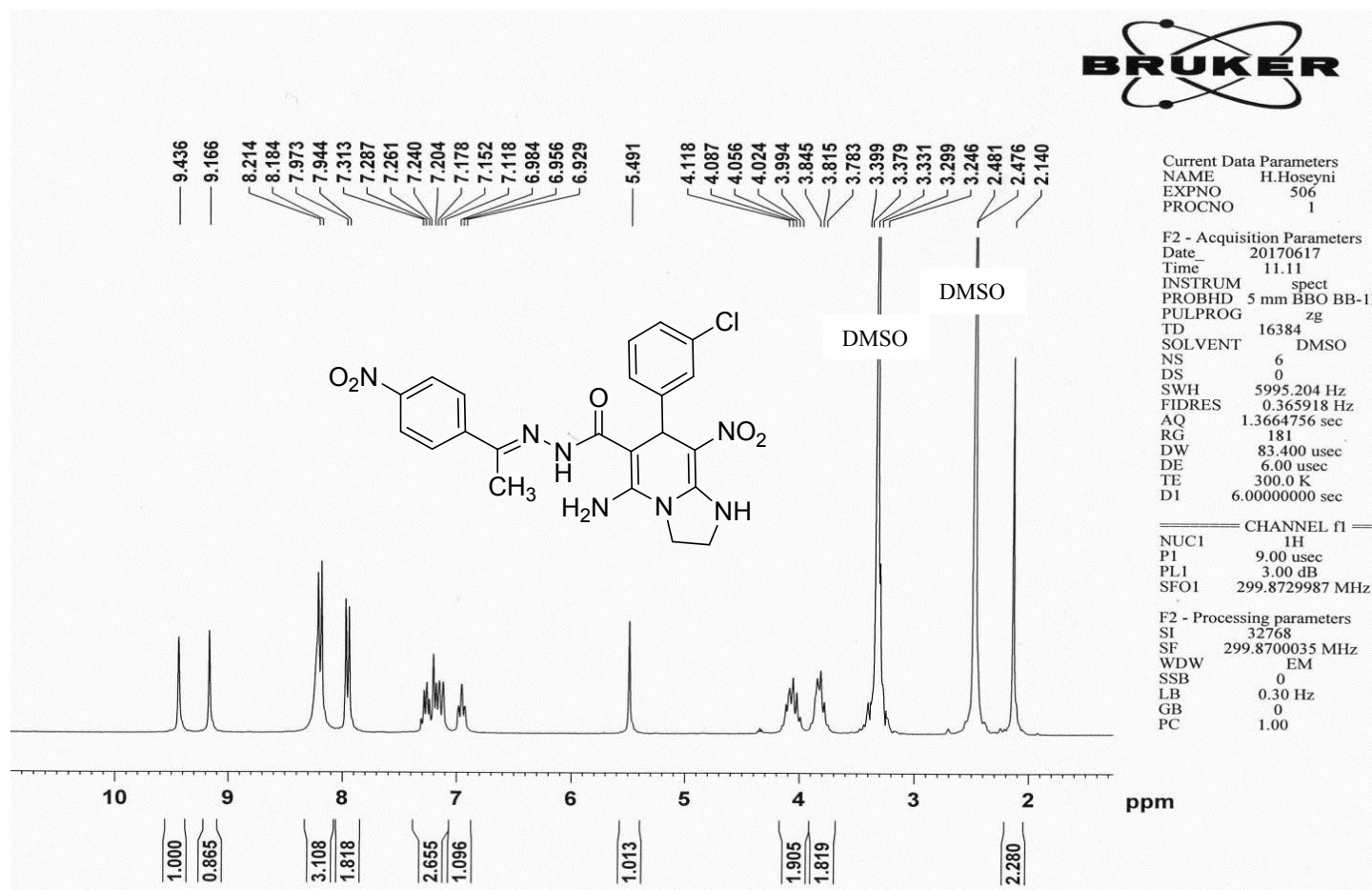


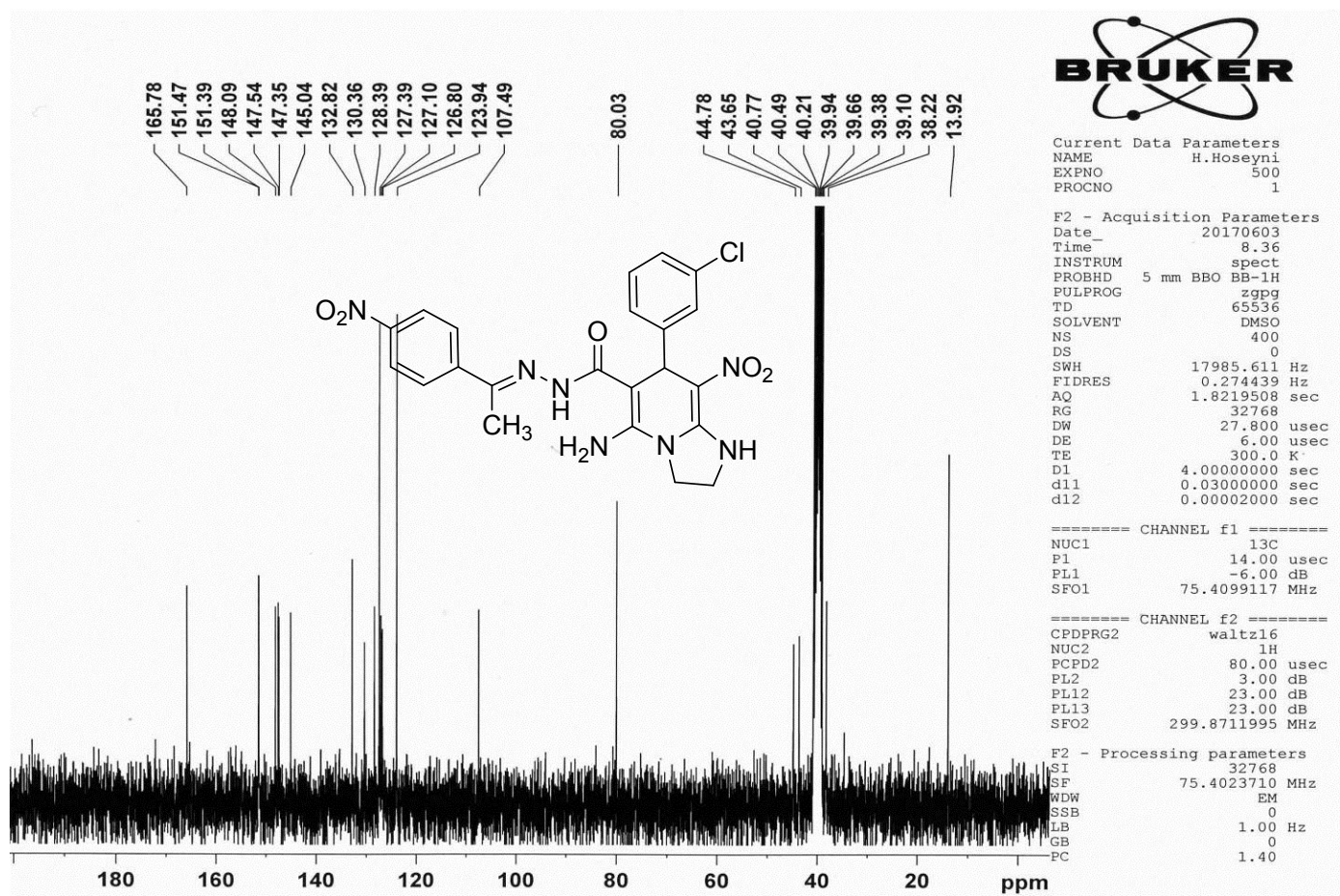
Figure 1. Structure of all products **6a-q**.

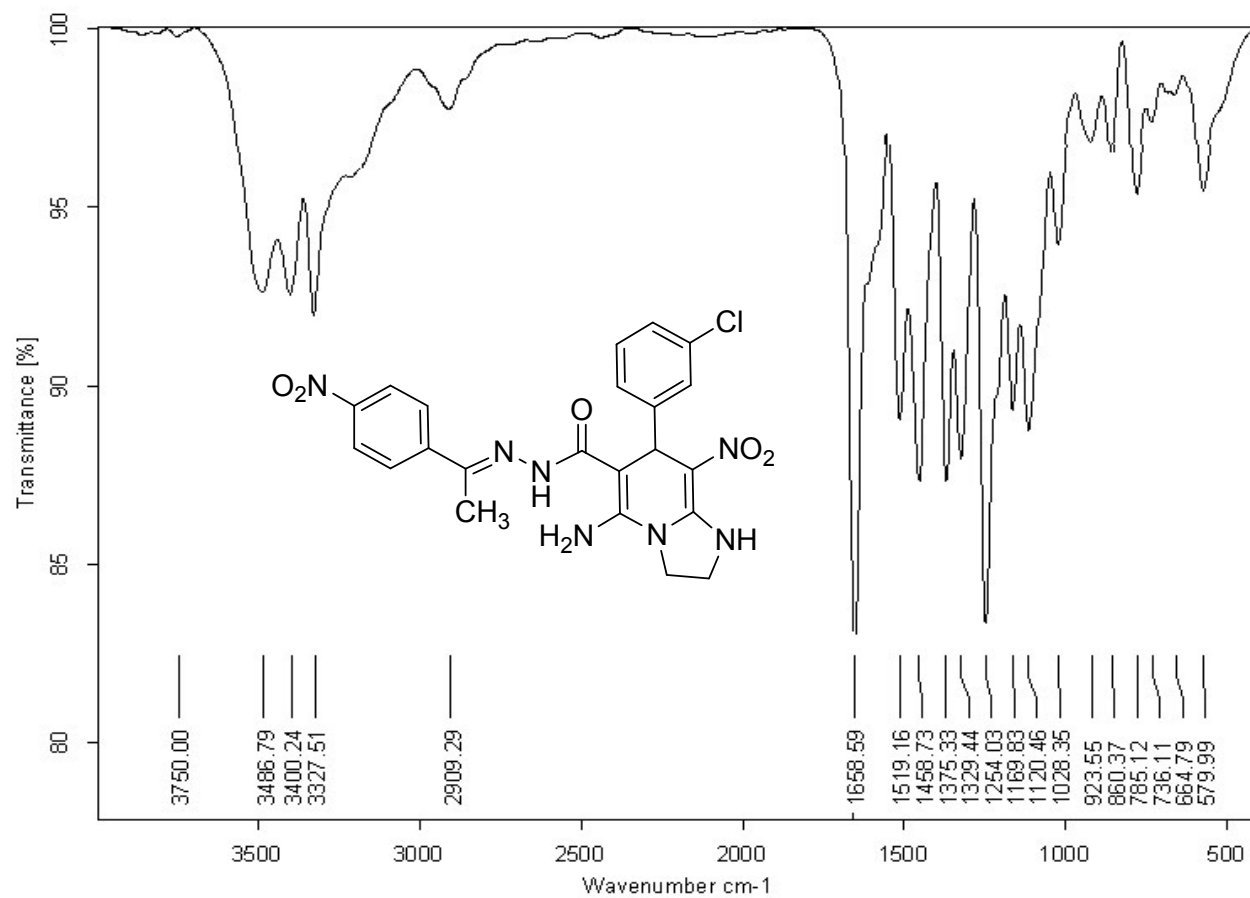
The structures of all products **6a-q** were deduced from their IR, mass, ^1H NMR, and ^{13}C NMR spectra (see the following images).

The ^1H and ^{13}C NMR spectra are taken in $\text{DMSO-}d_6$, but some of the products are slightly soluble in the solvent therefore have no clear carbon spectra such as **6g, 6h, 6m, 6o, 6p, 6q**.



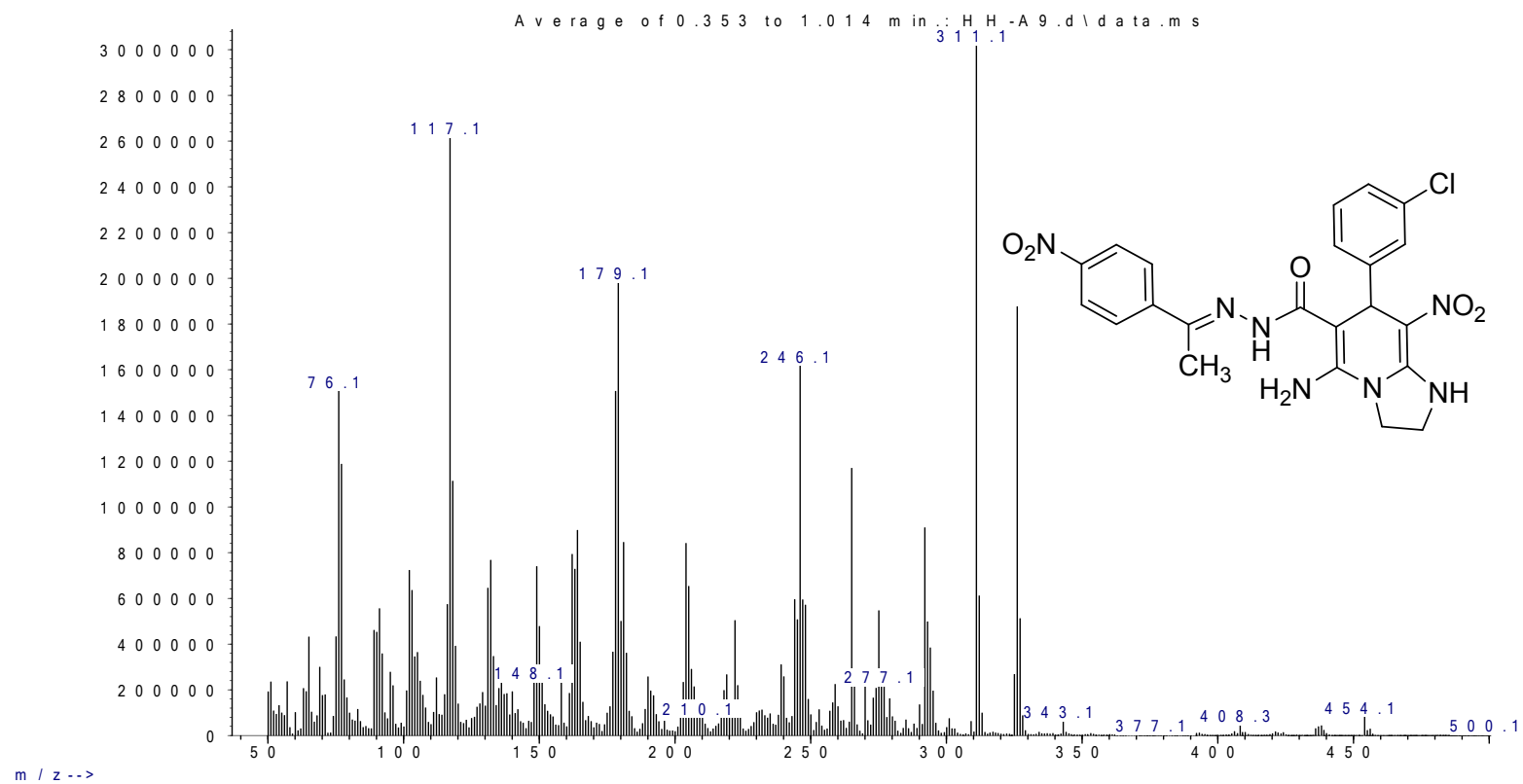
¹H NMR of 6a

¹³C NMR of 6a

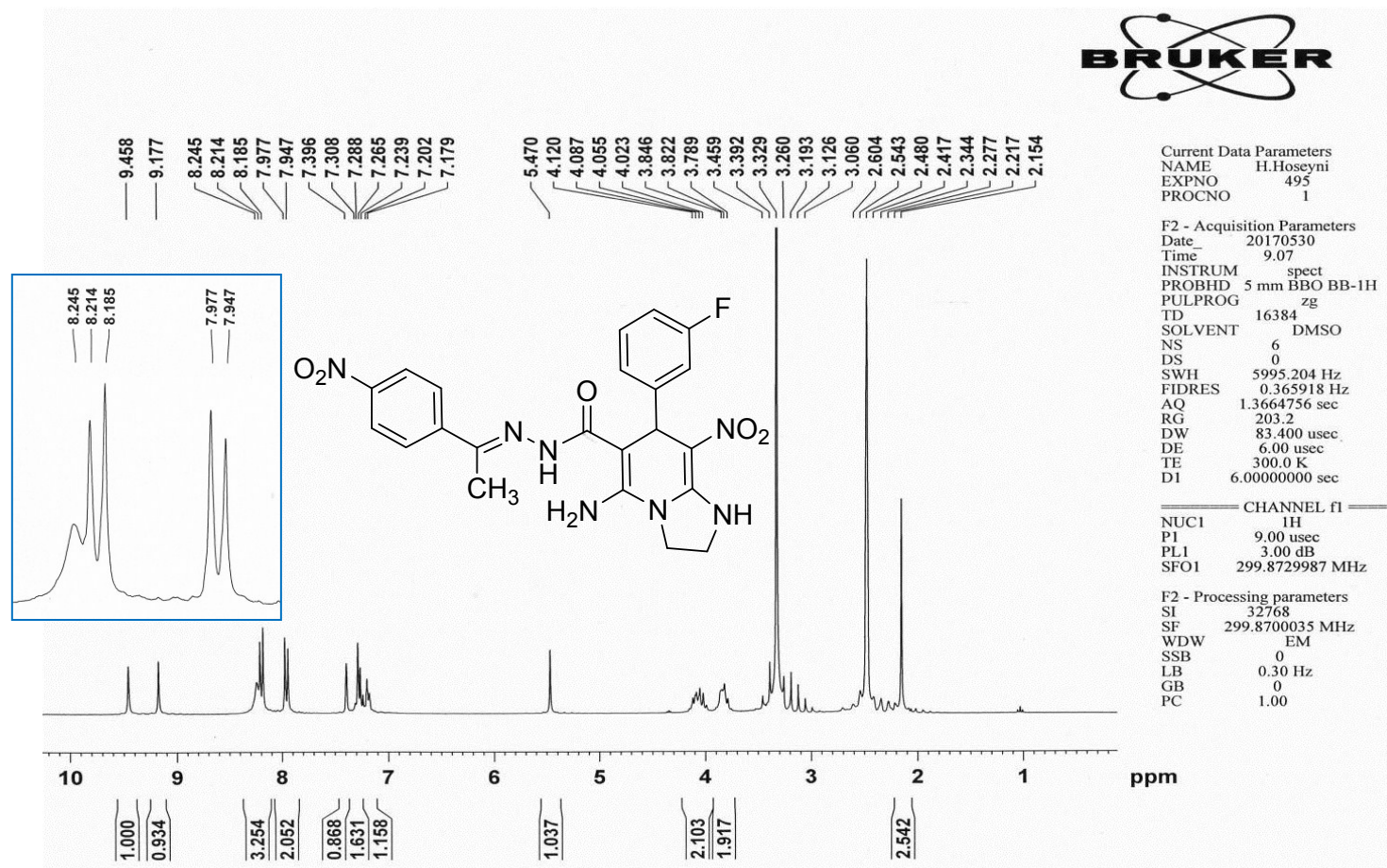


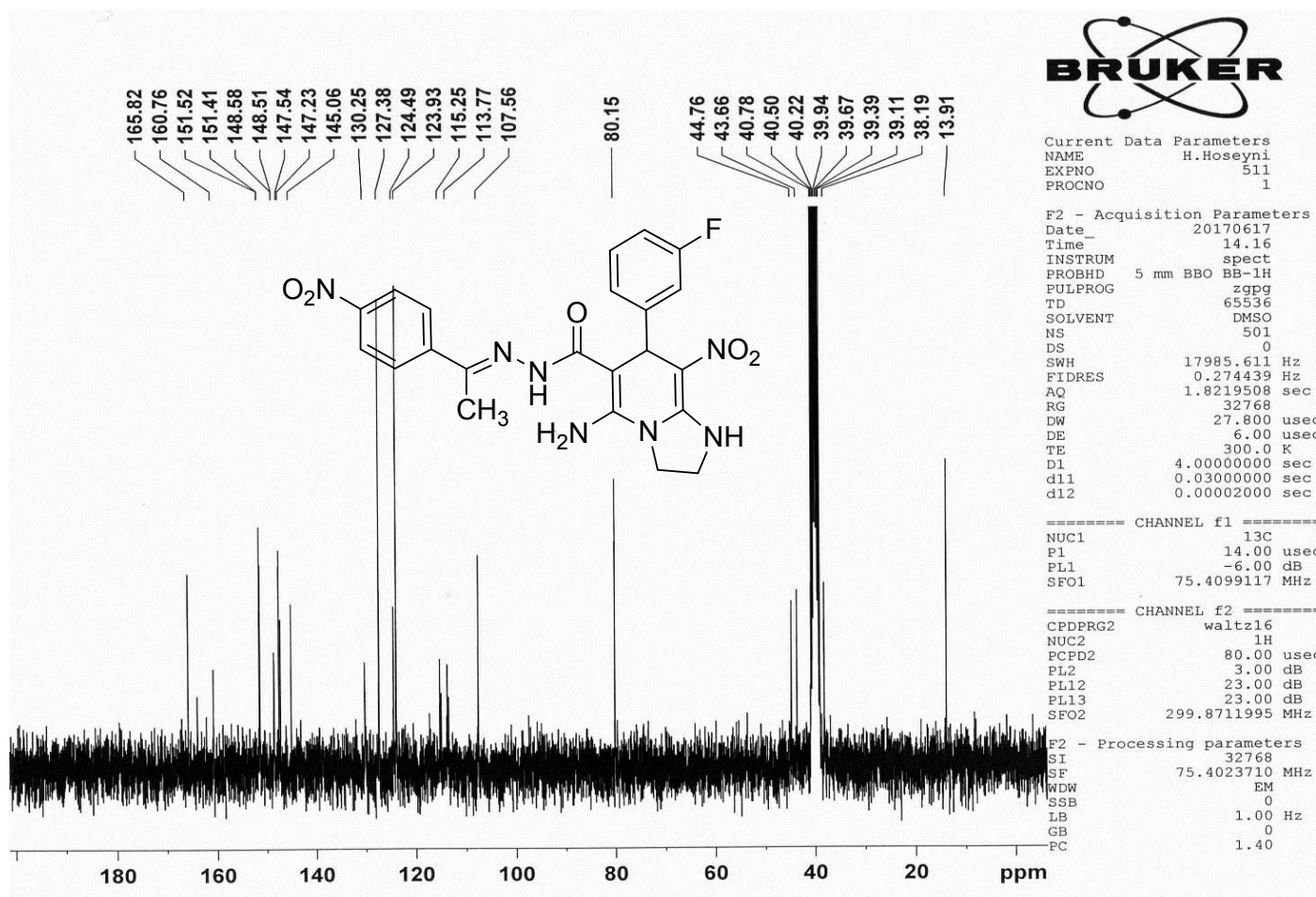
IR of 6a

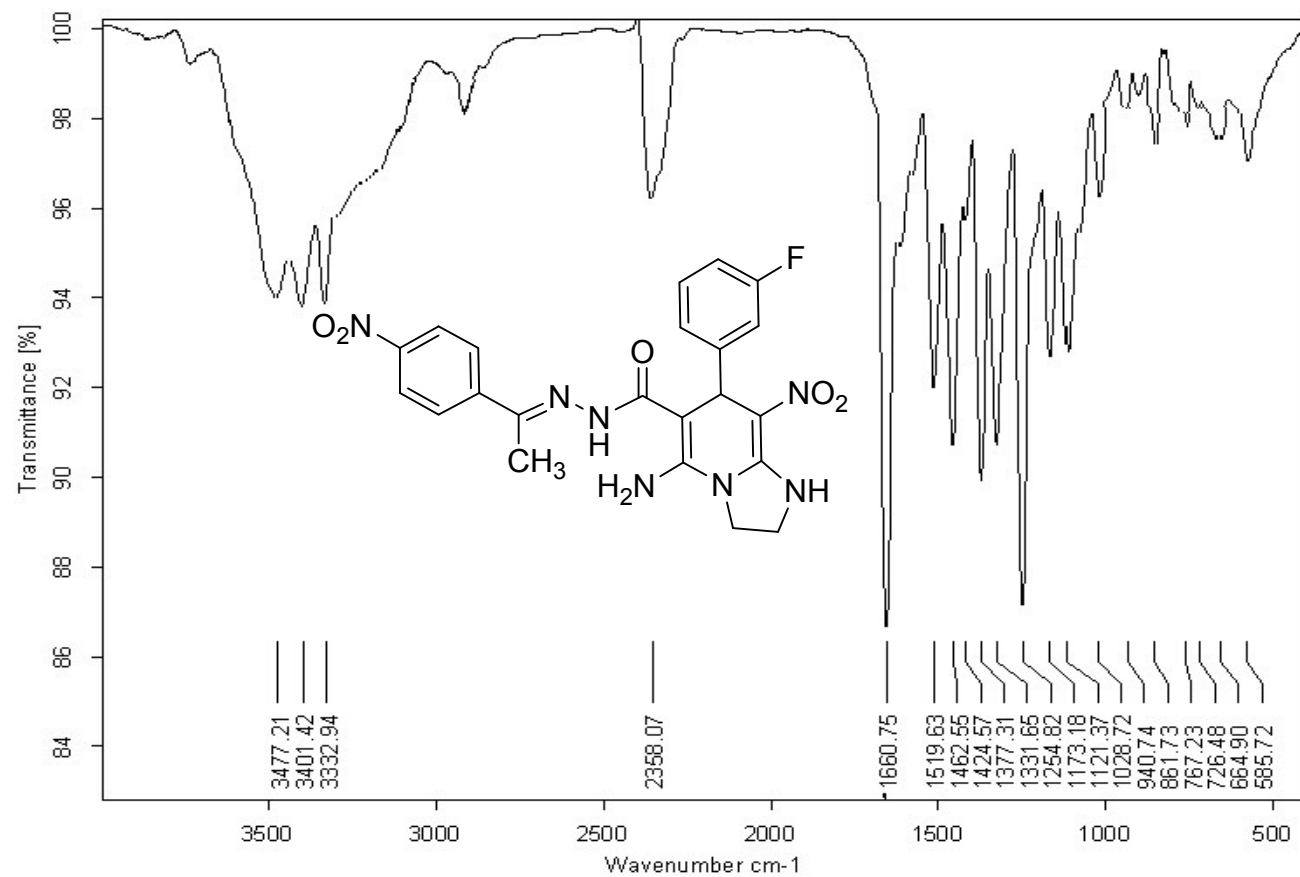
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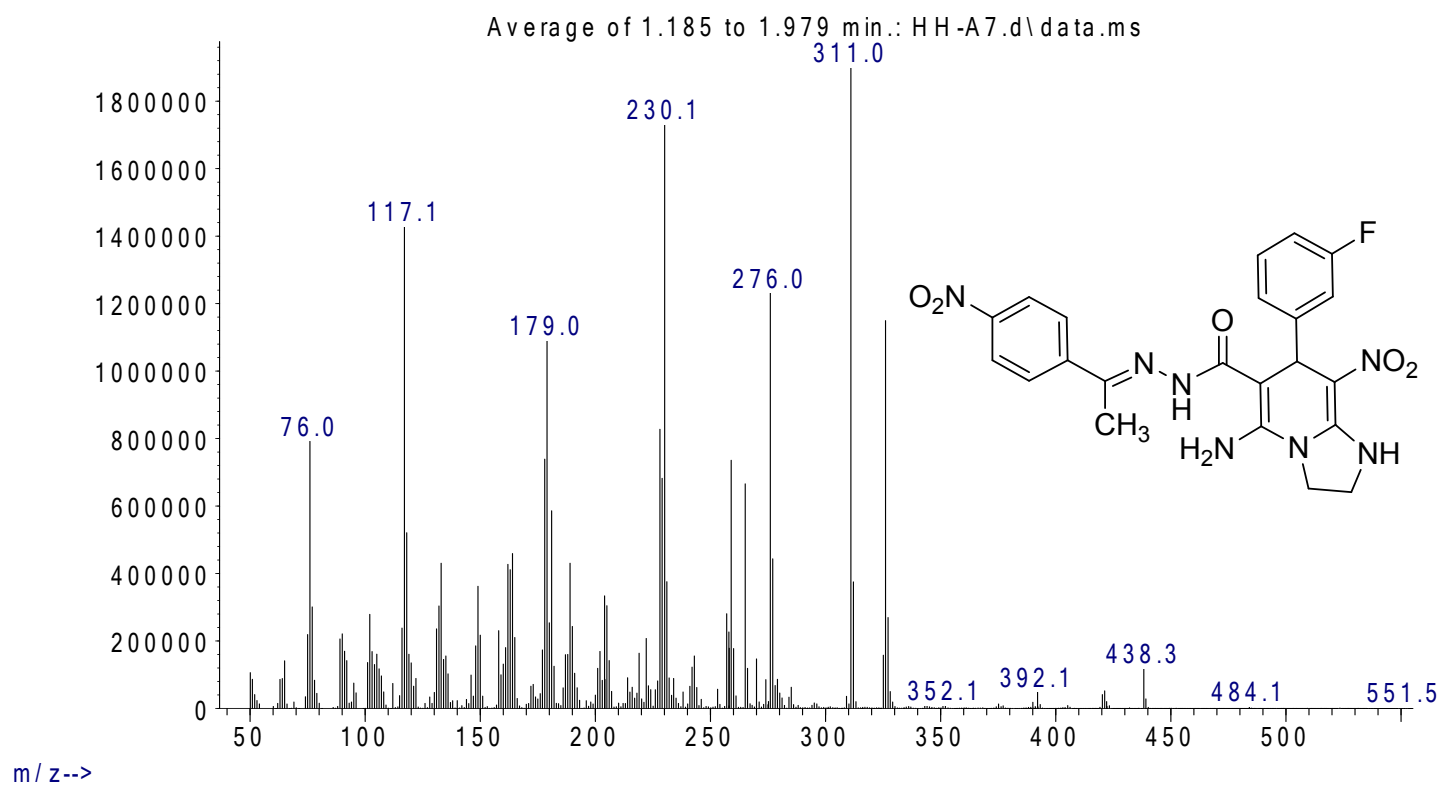
MS of 6a

**¹H NMR of 6b**

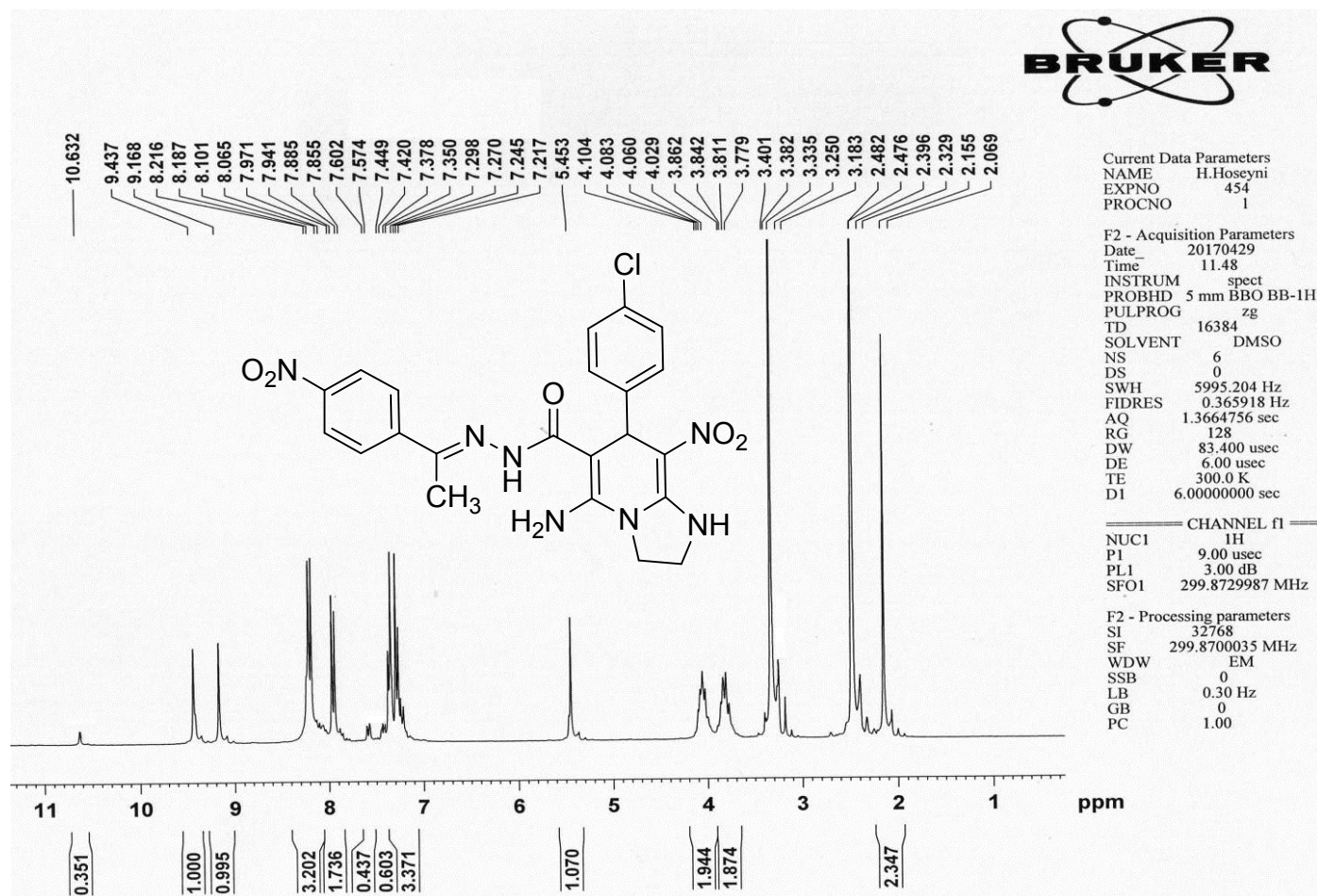
¹³C NMR of 6b

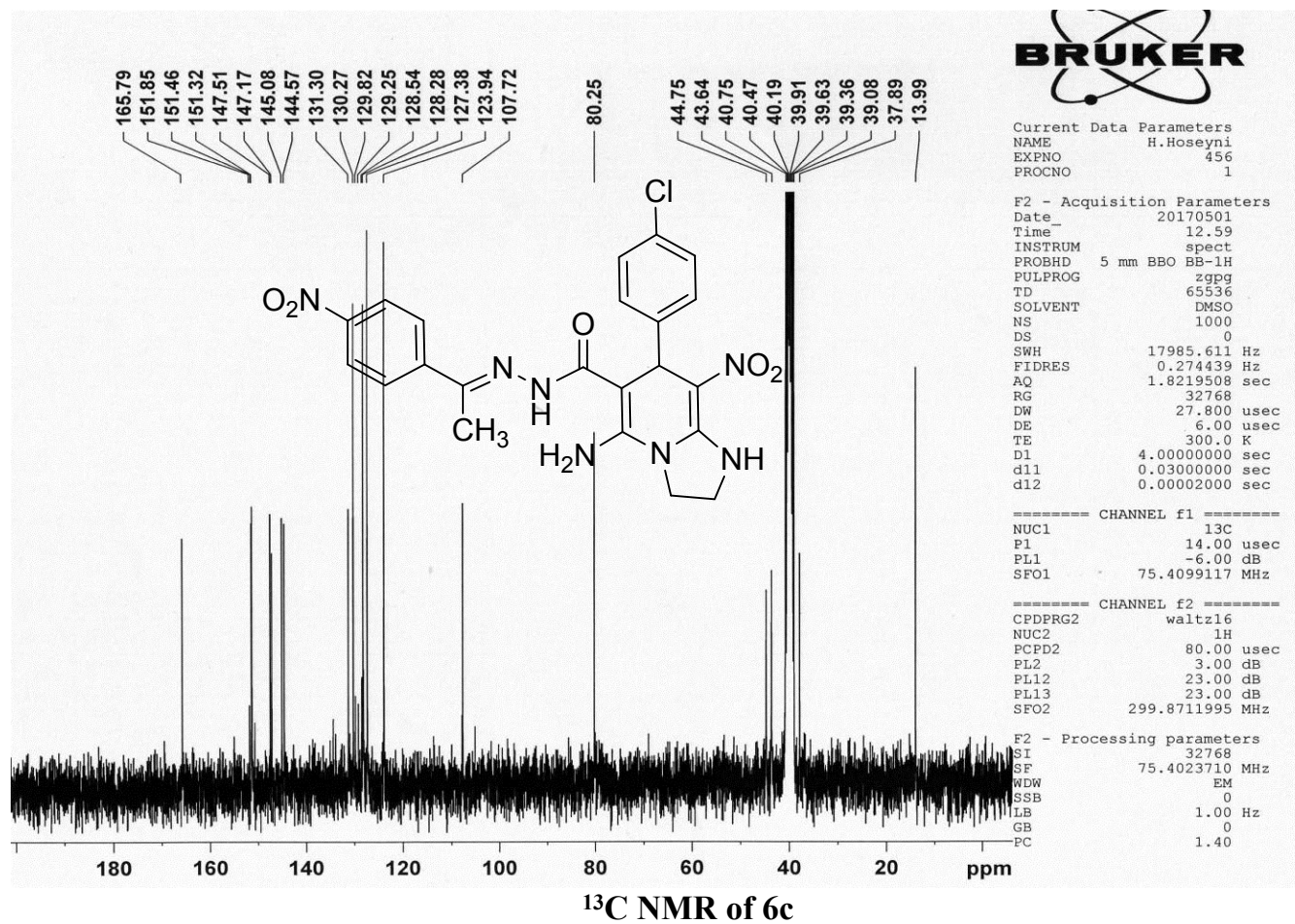
**IR of 6b**

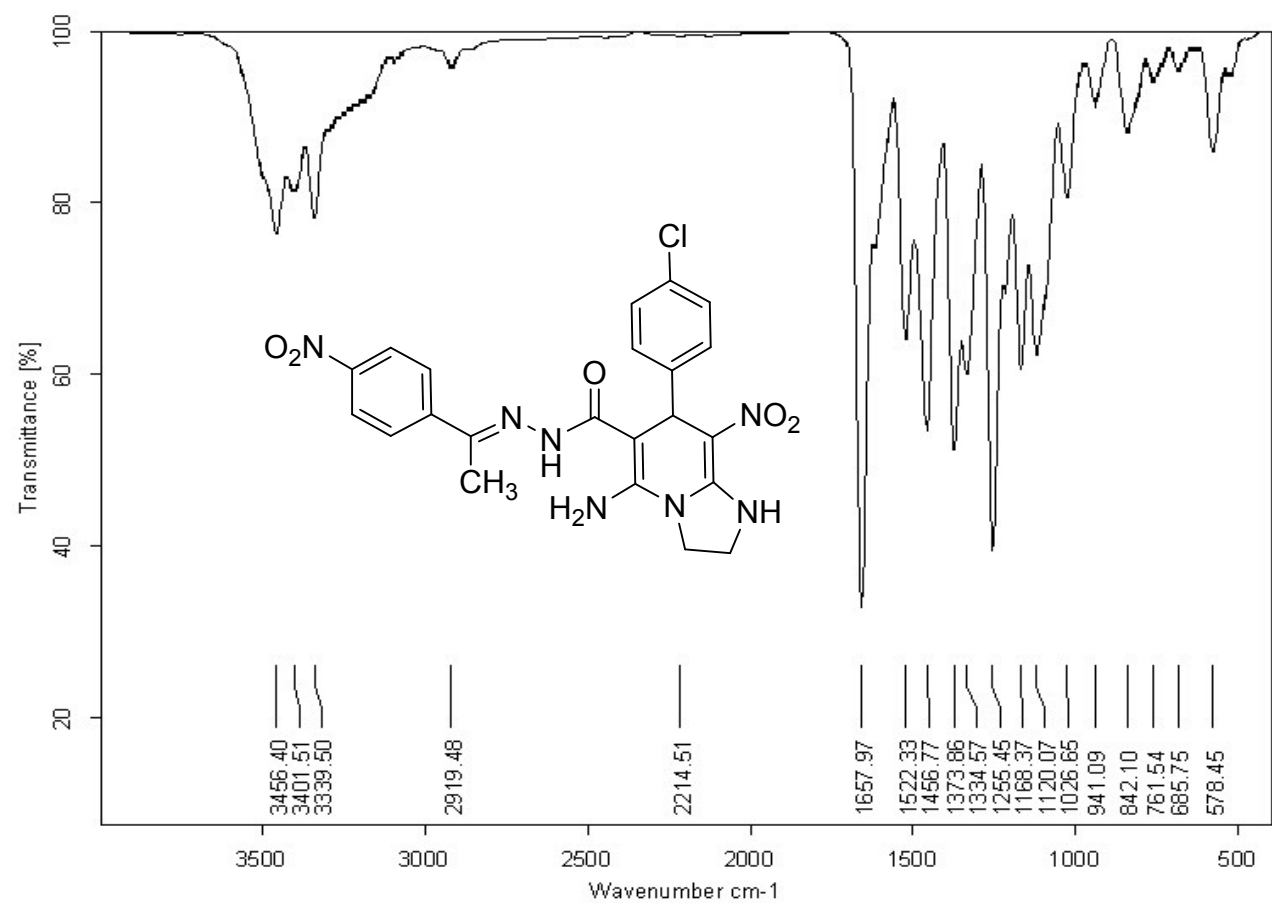
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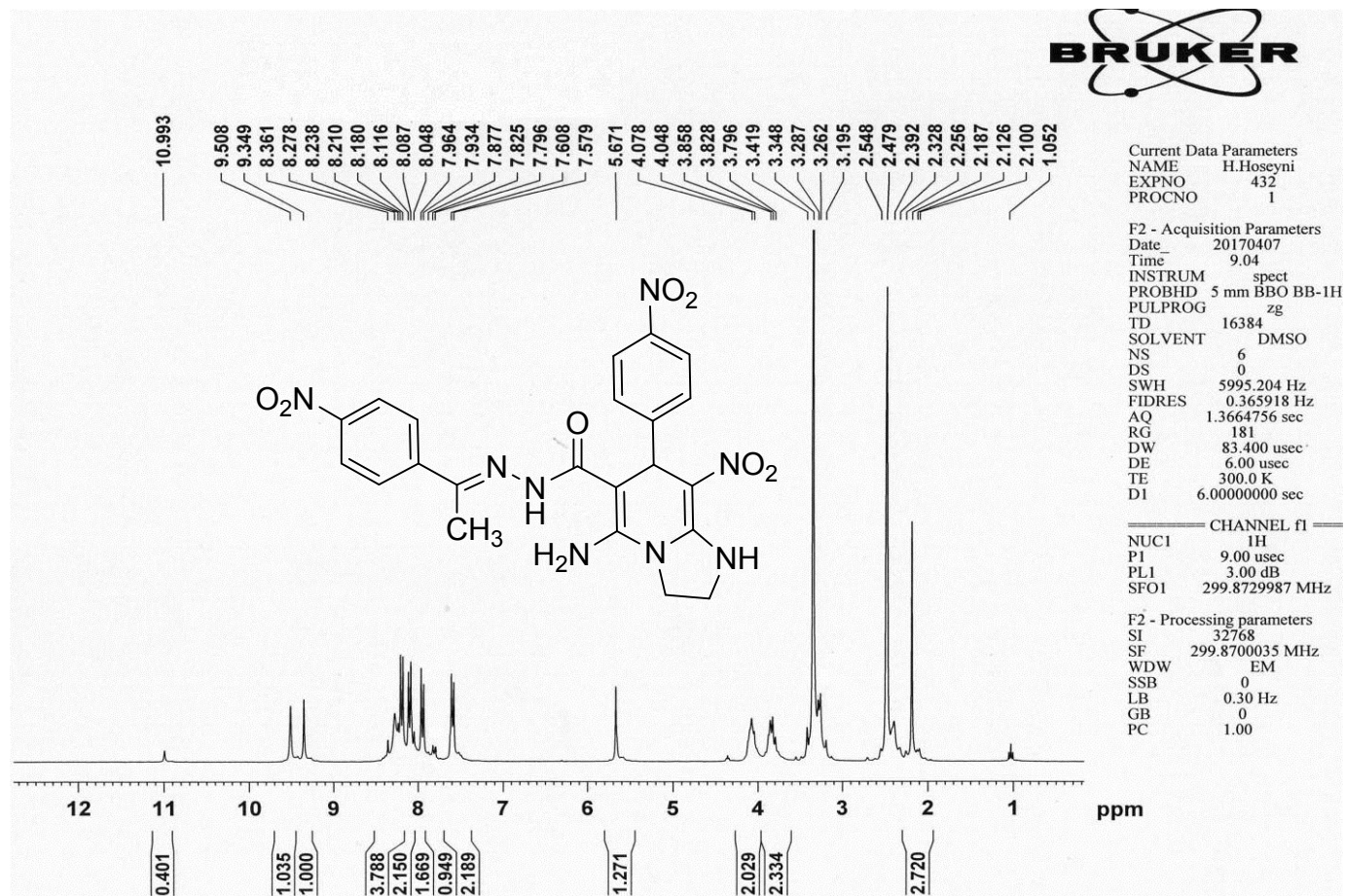
MS of 6b

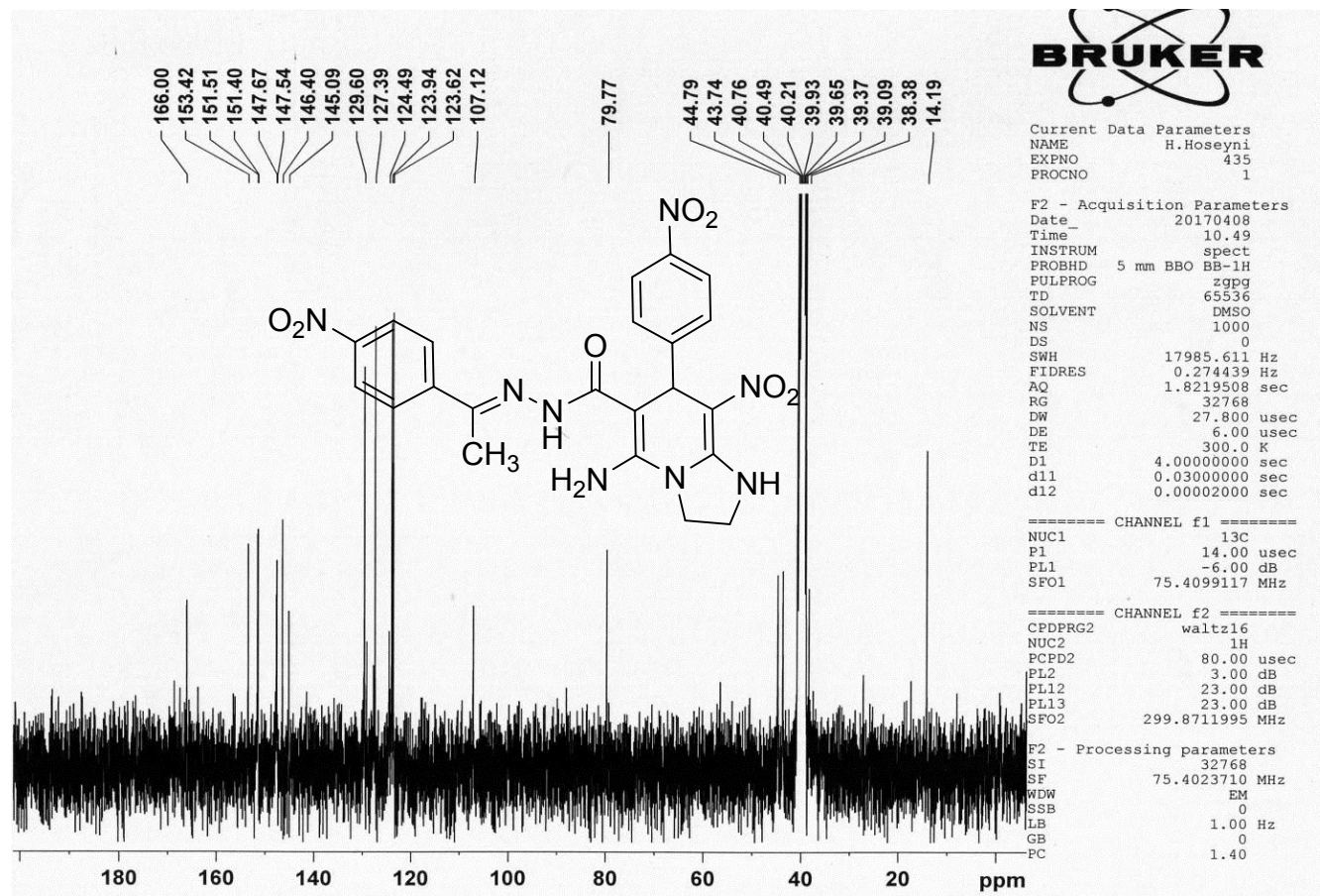
¹H NMR of 6c



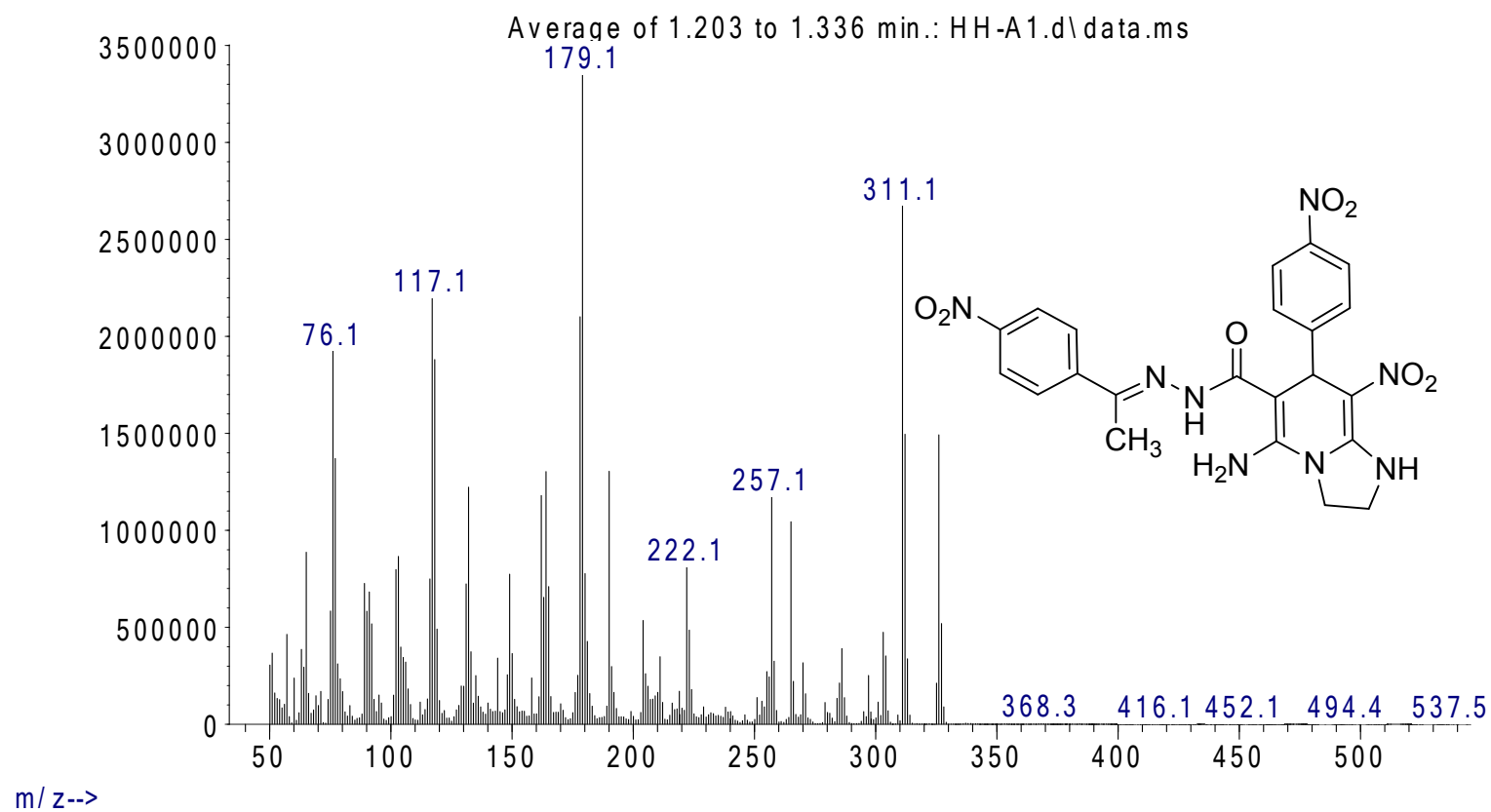


IR of 6c

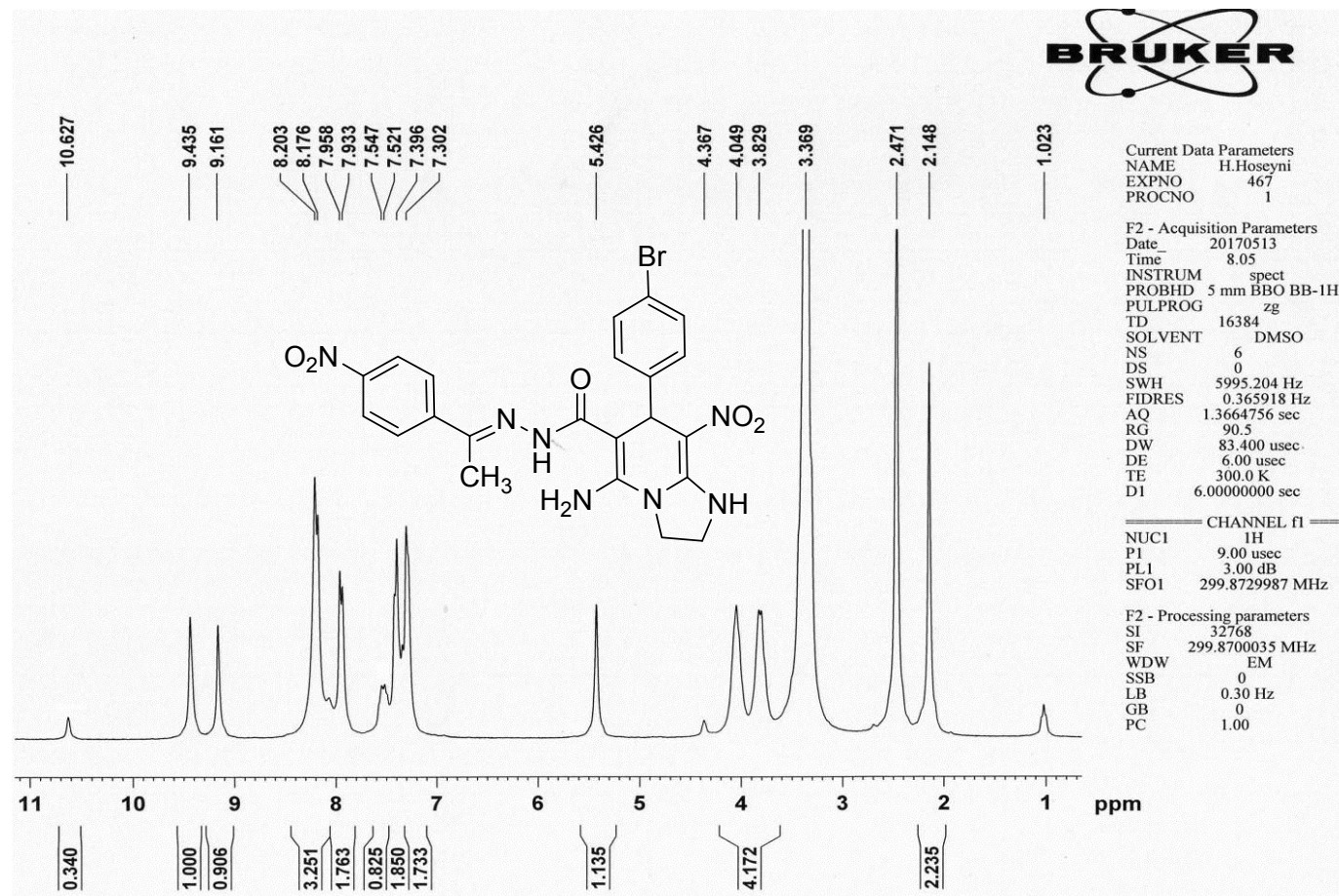
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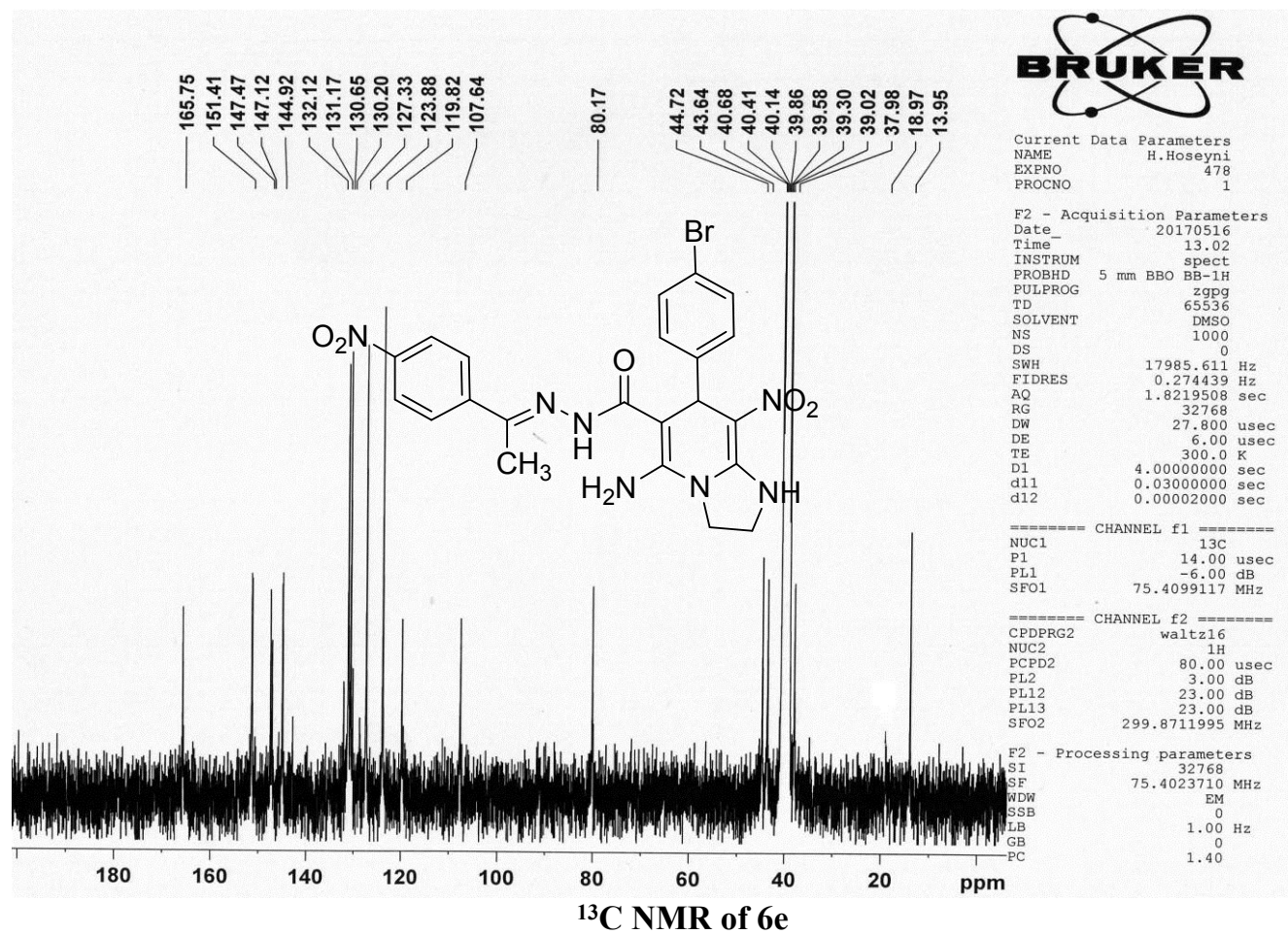


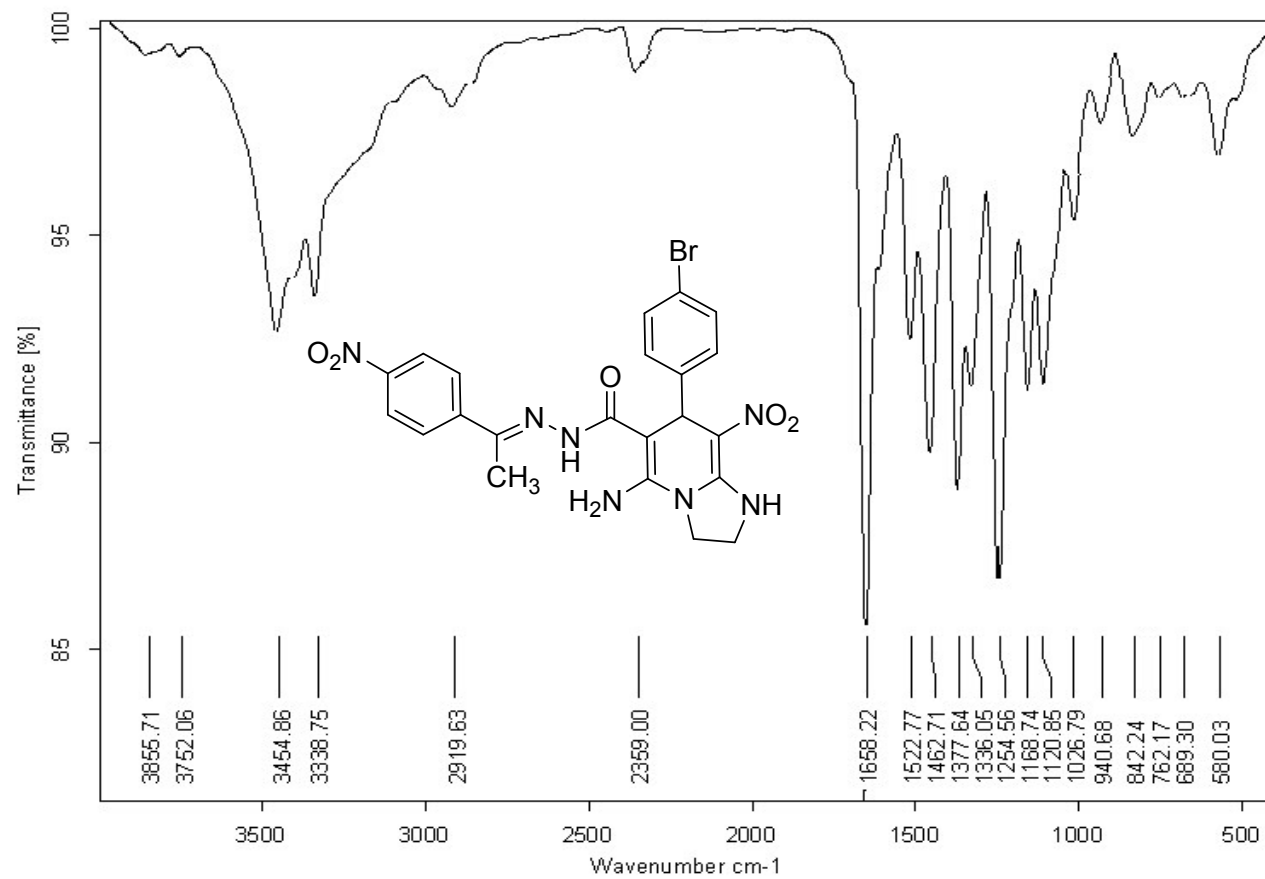
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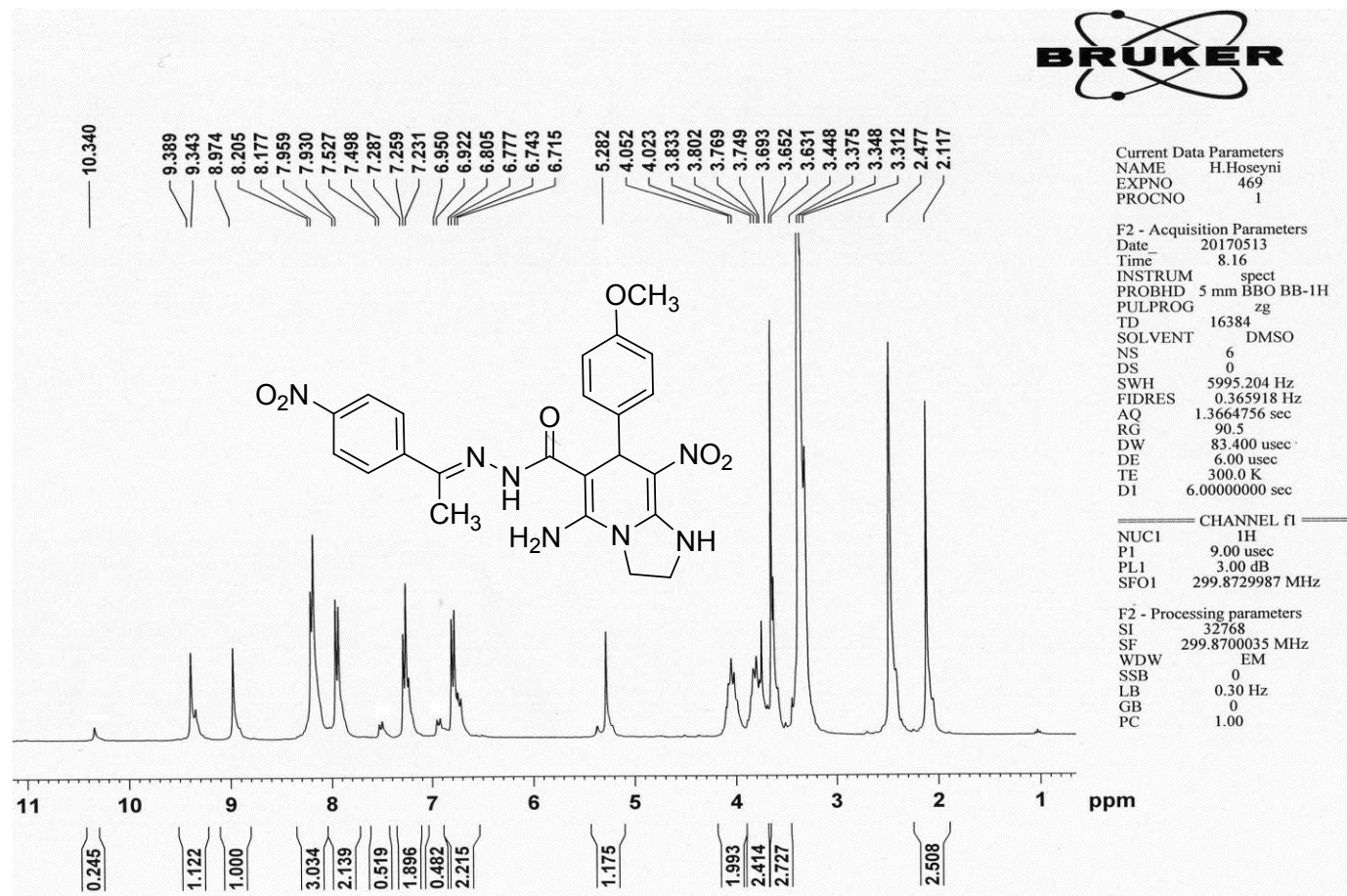
MS of 6d

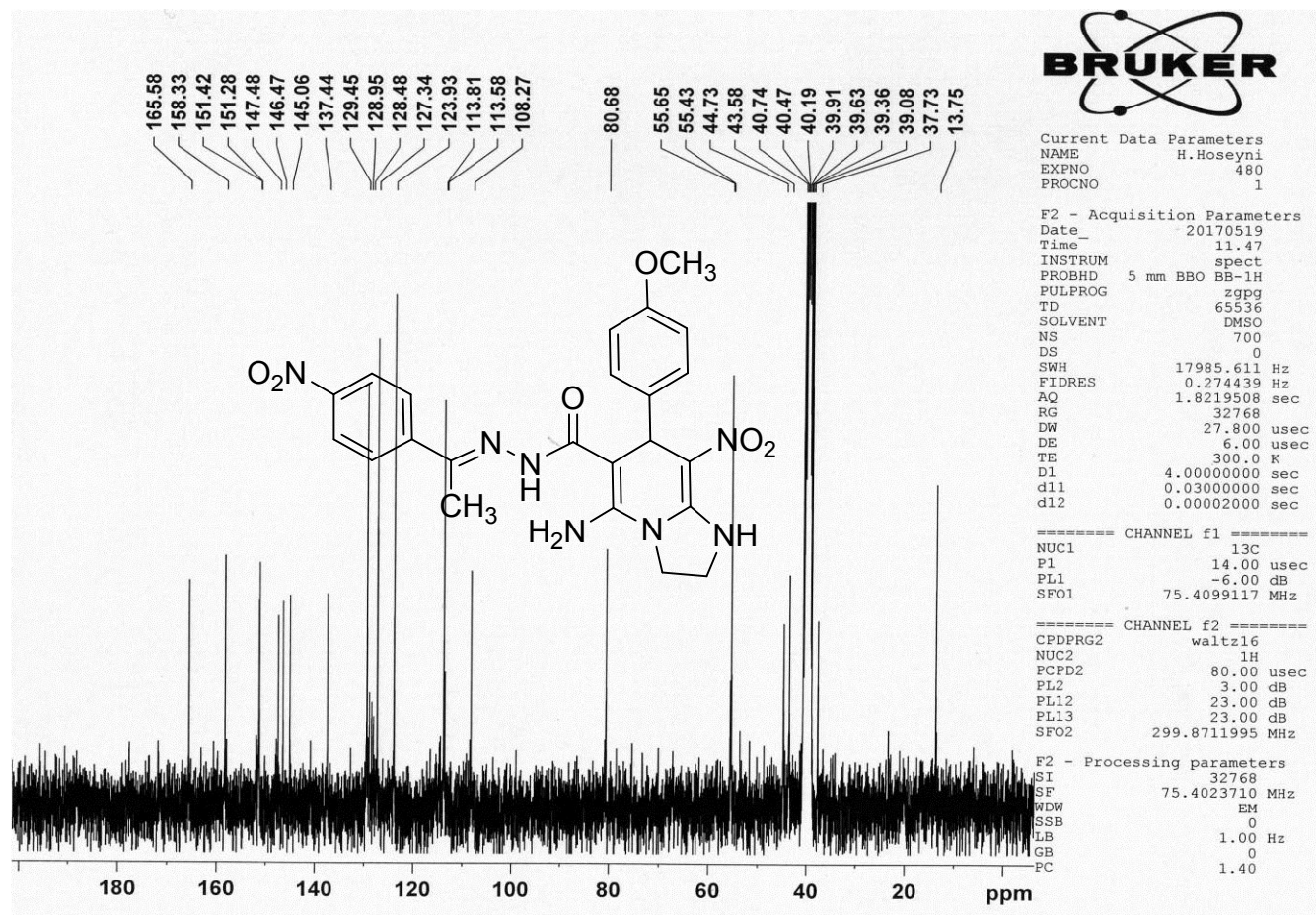
 ^1H NMR of 6e

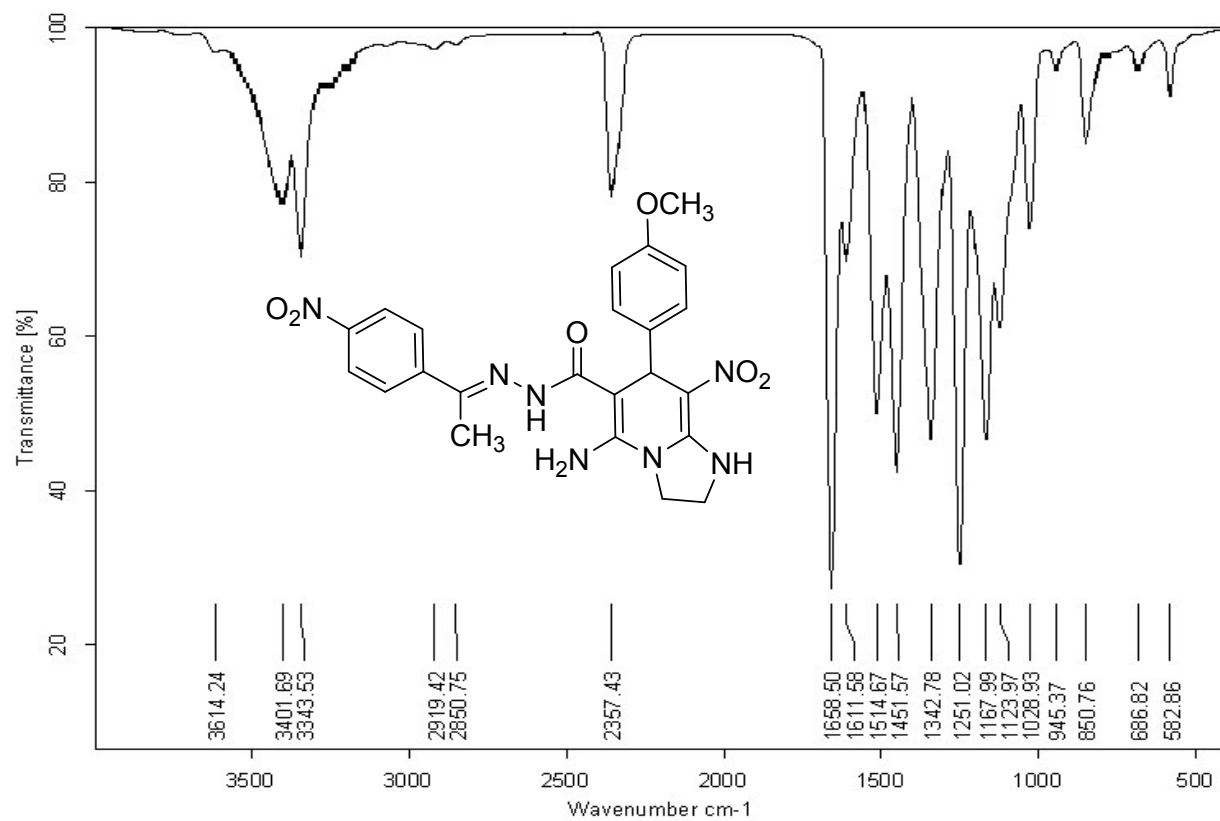


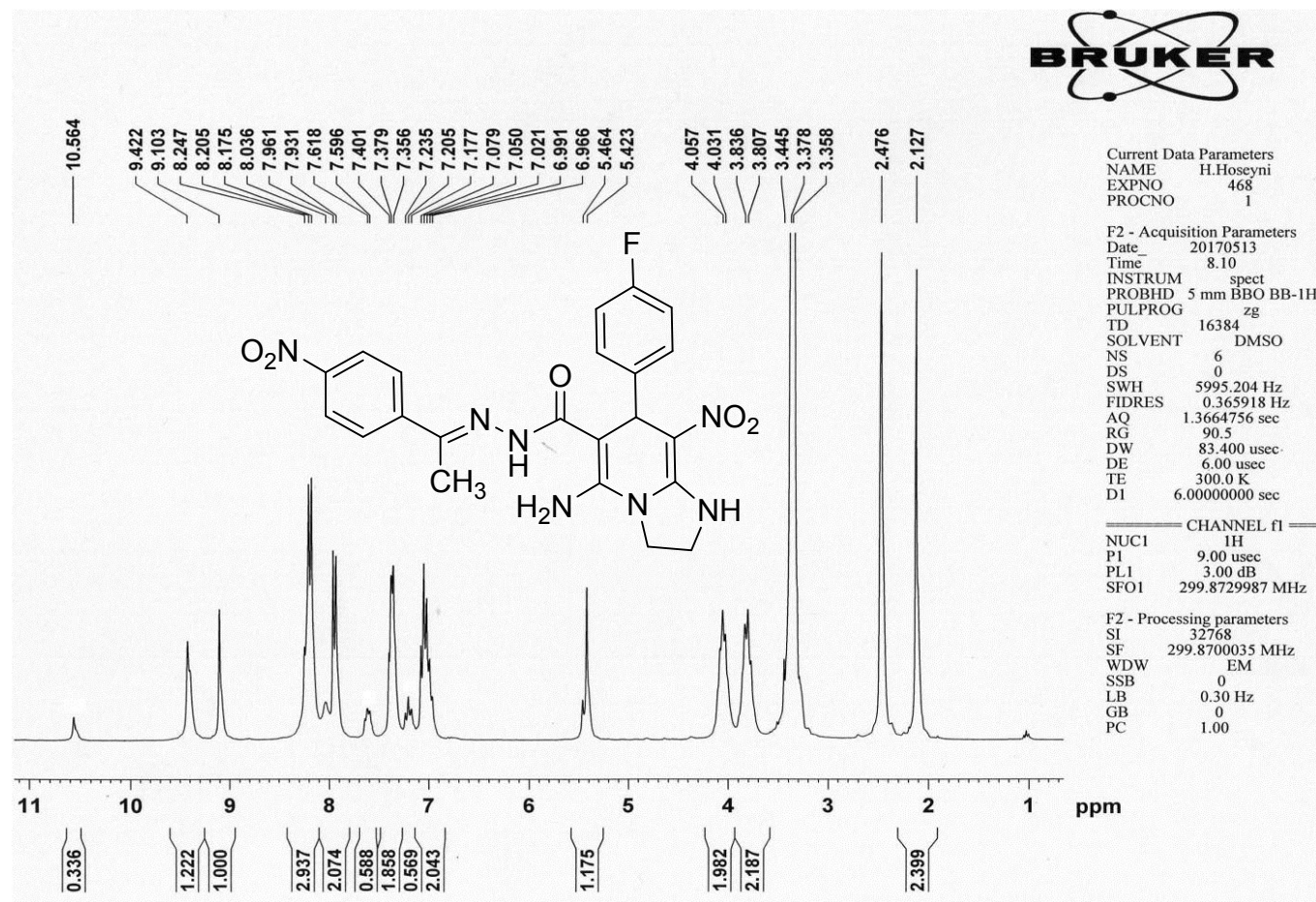


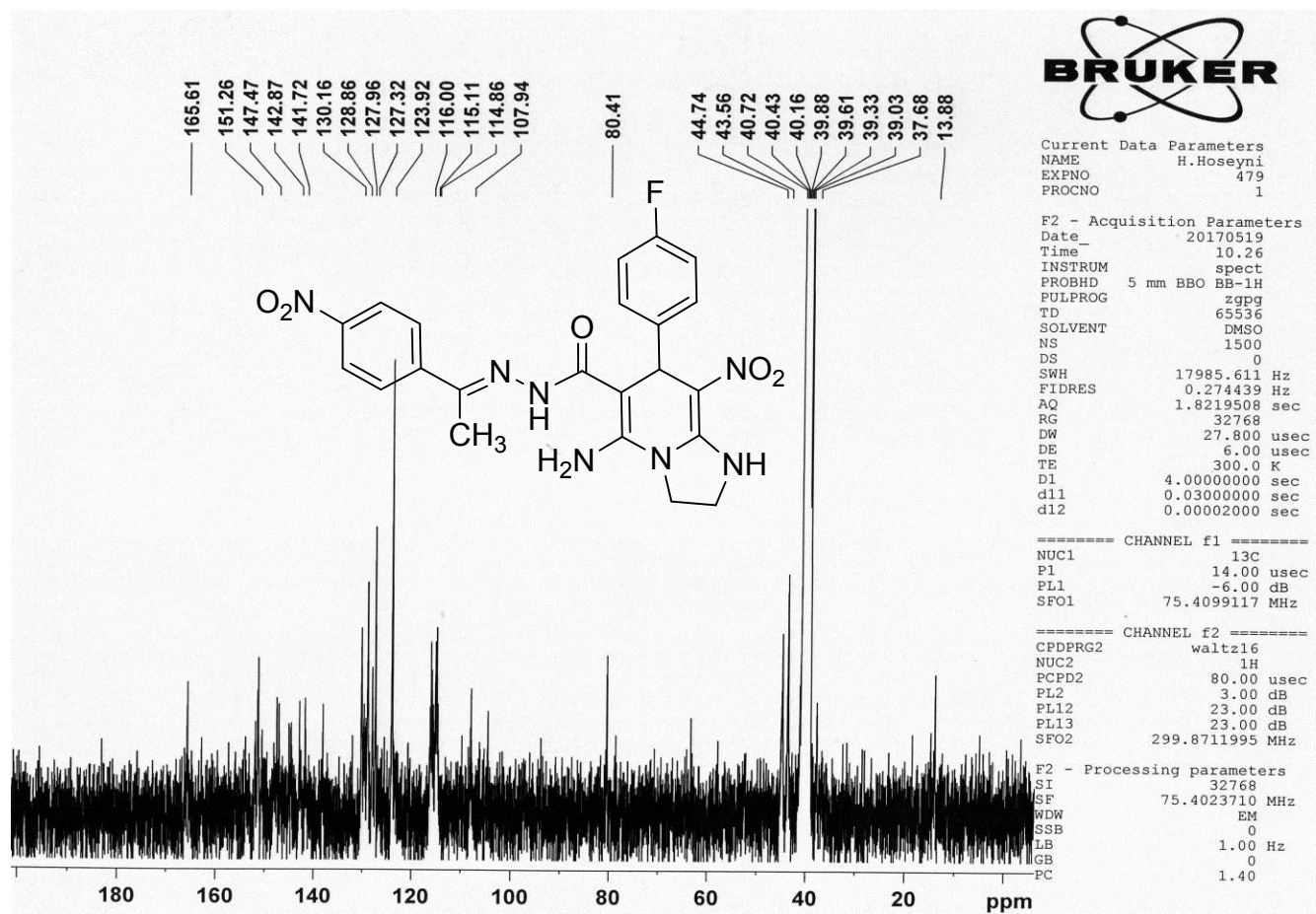
IR of 6e

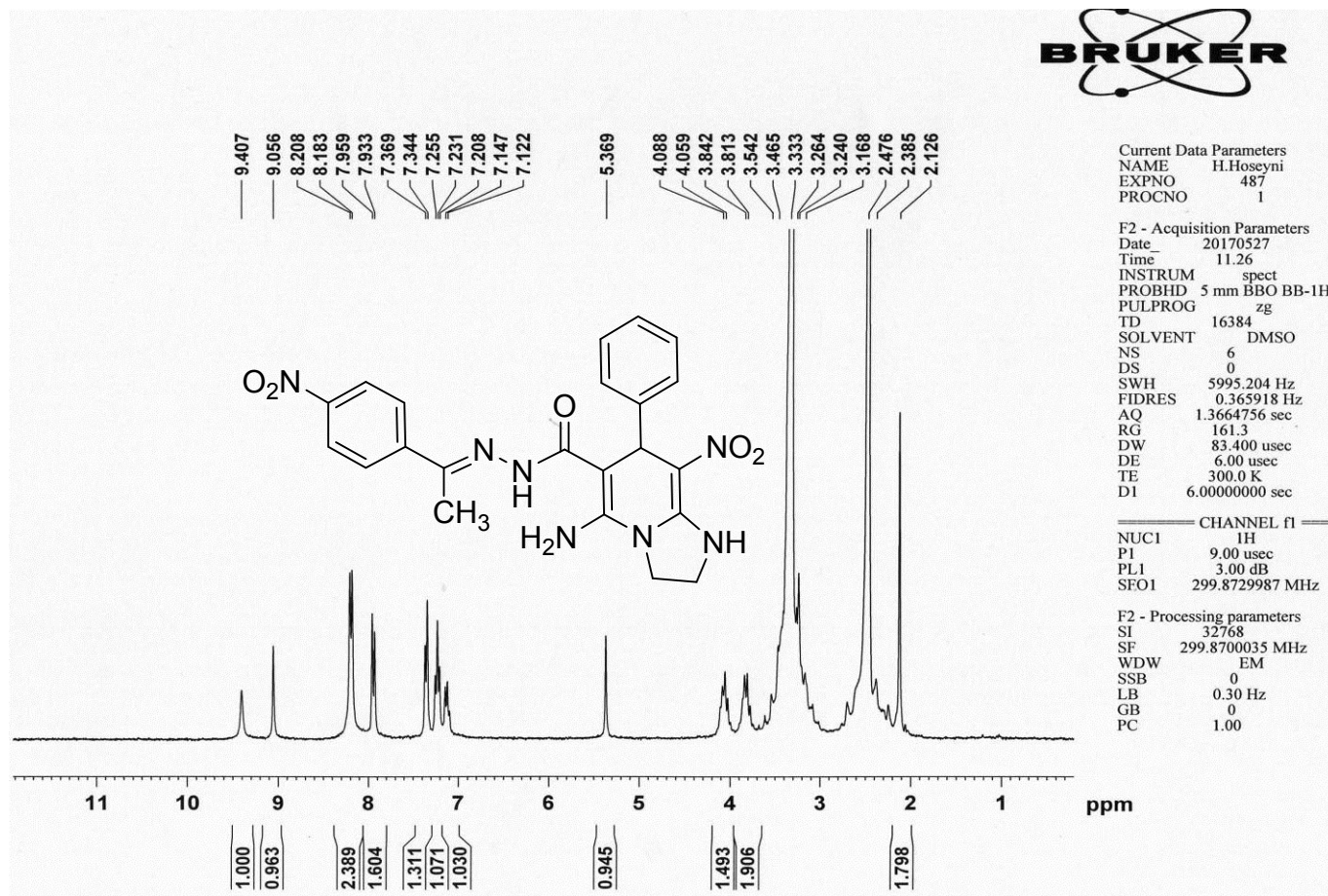
¹H NMR of 6f



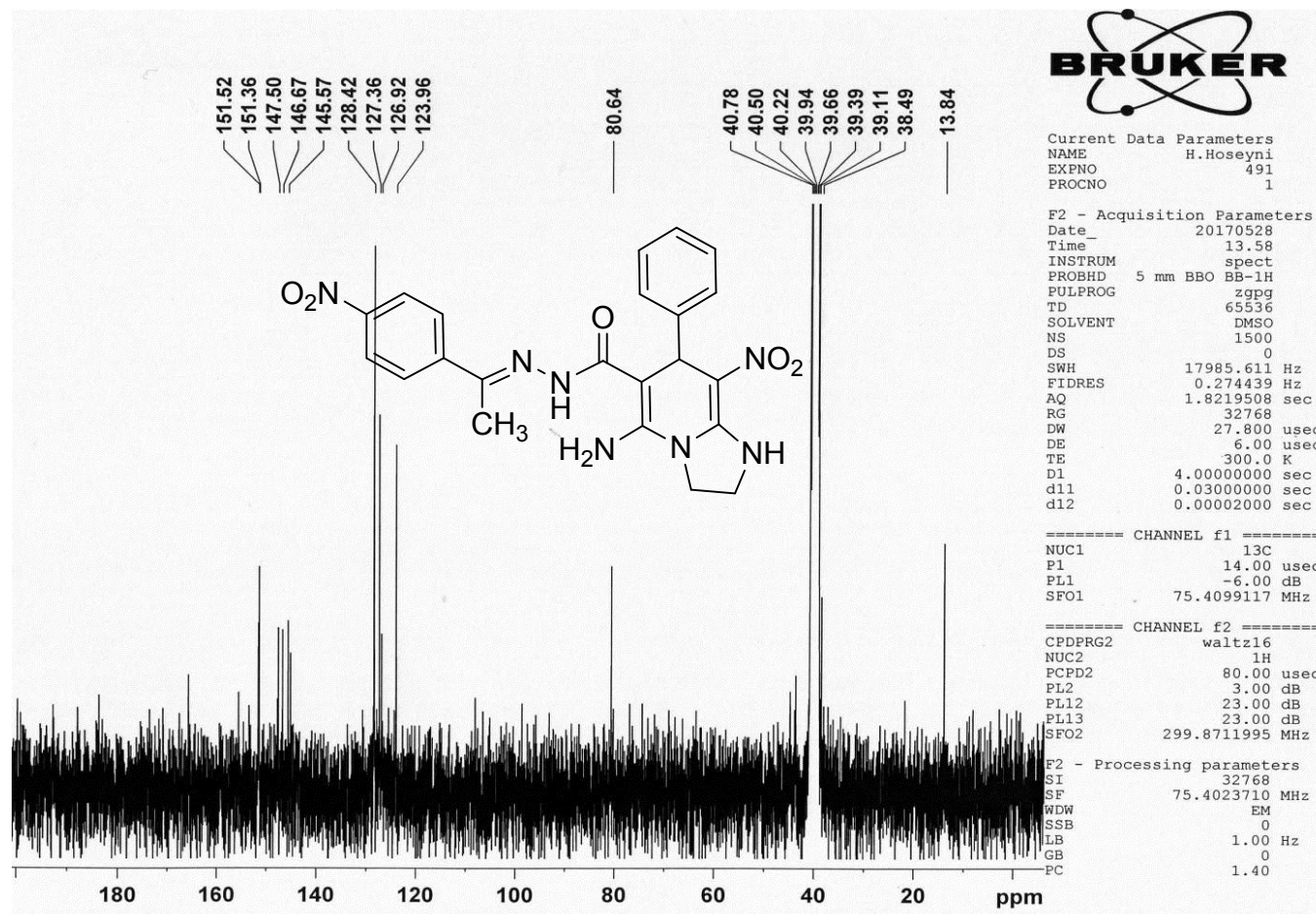
**IR of 6f**

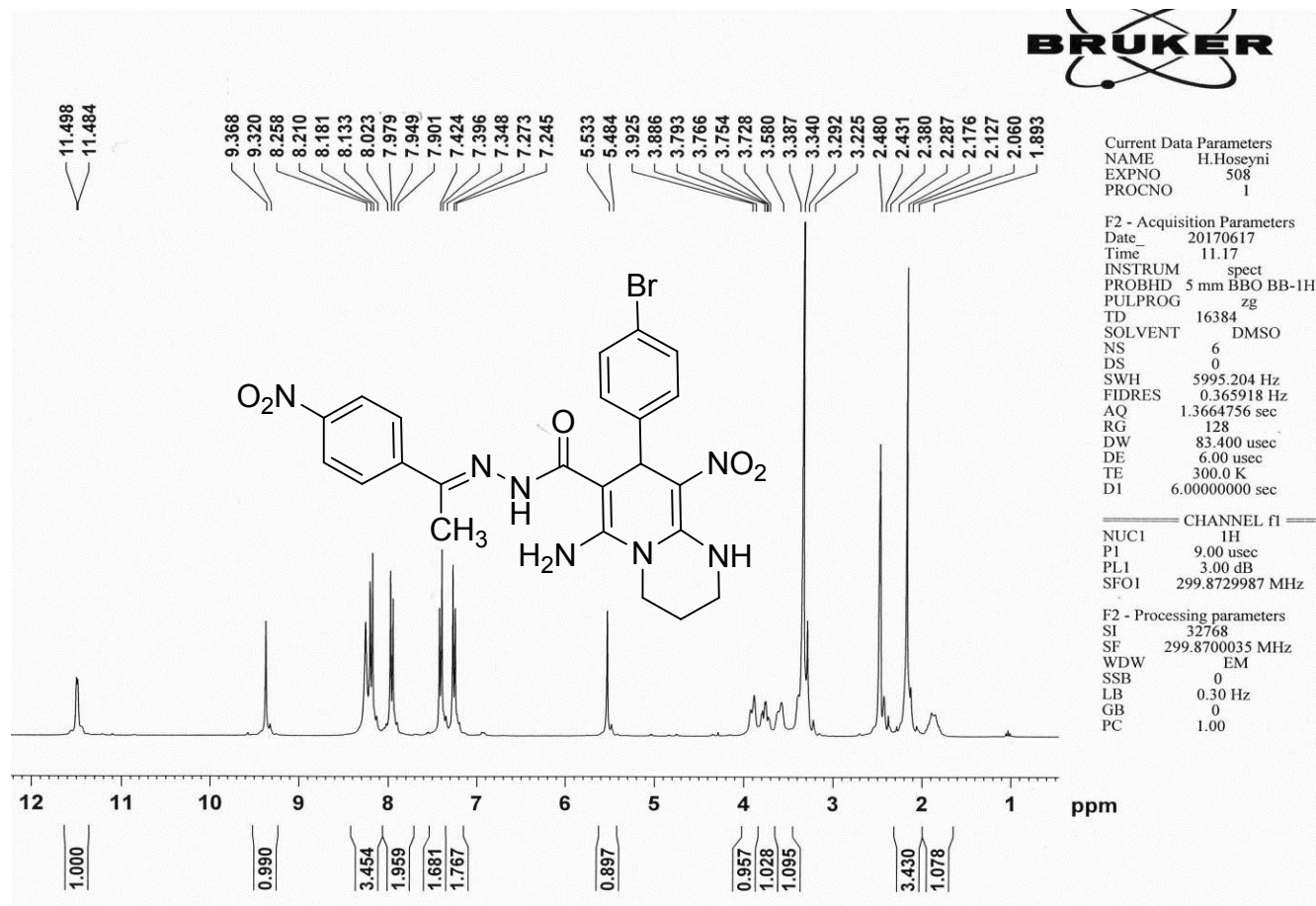
¹H NMR of 6g

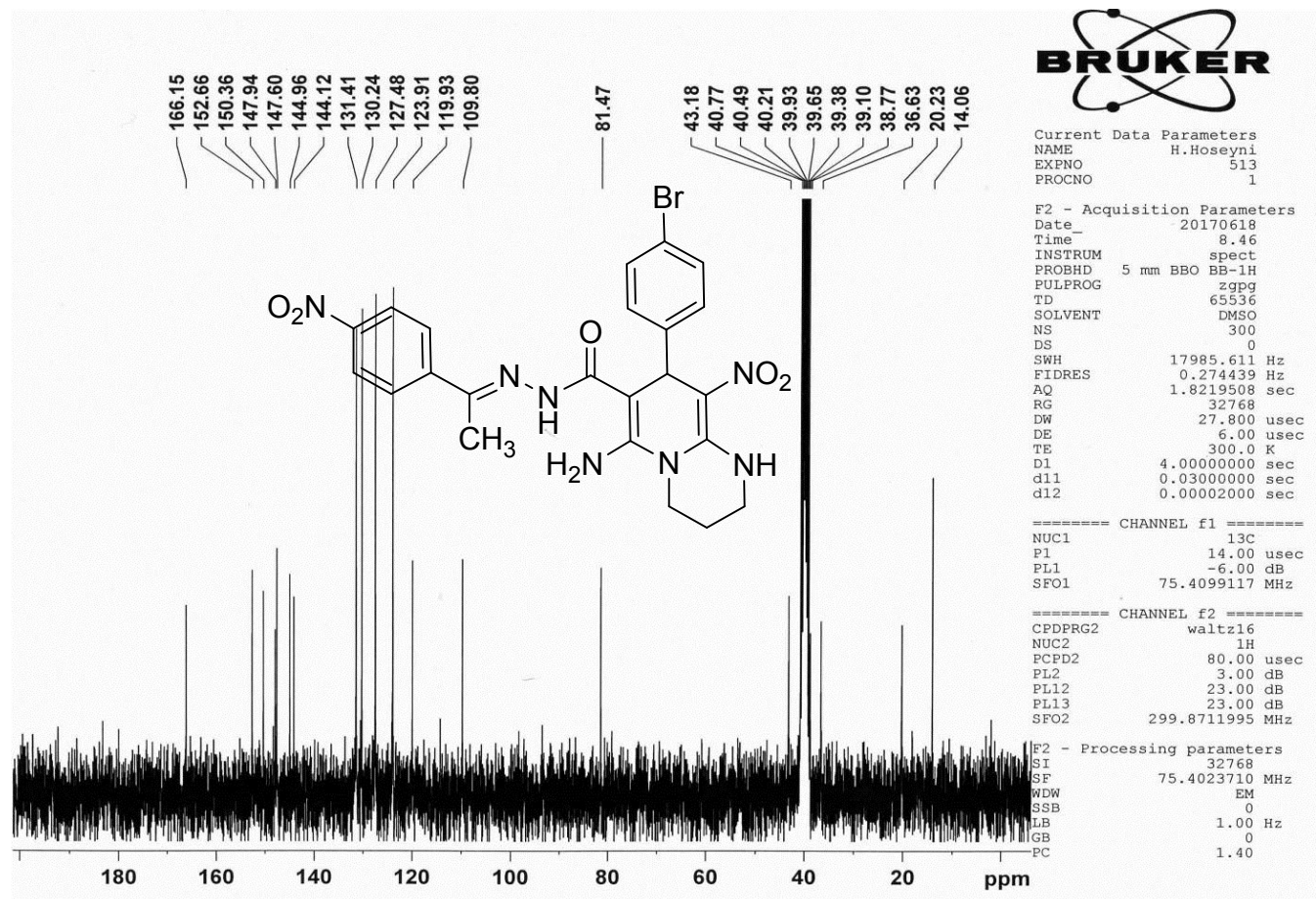


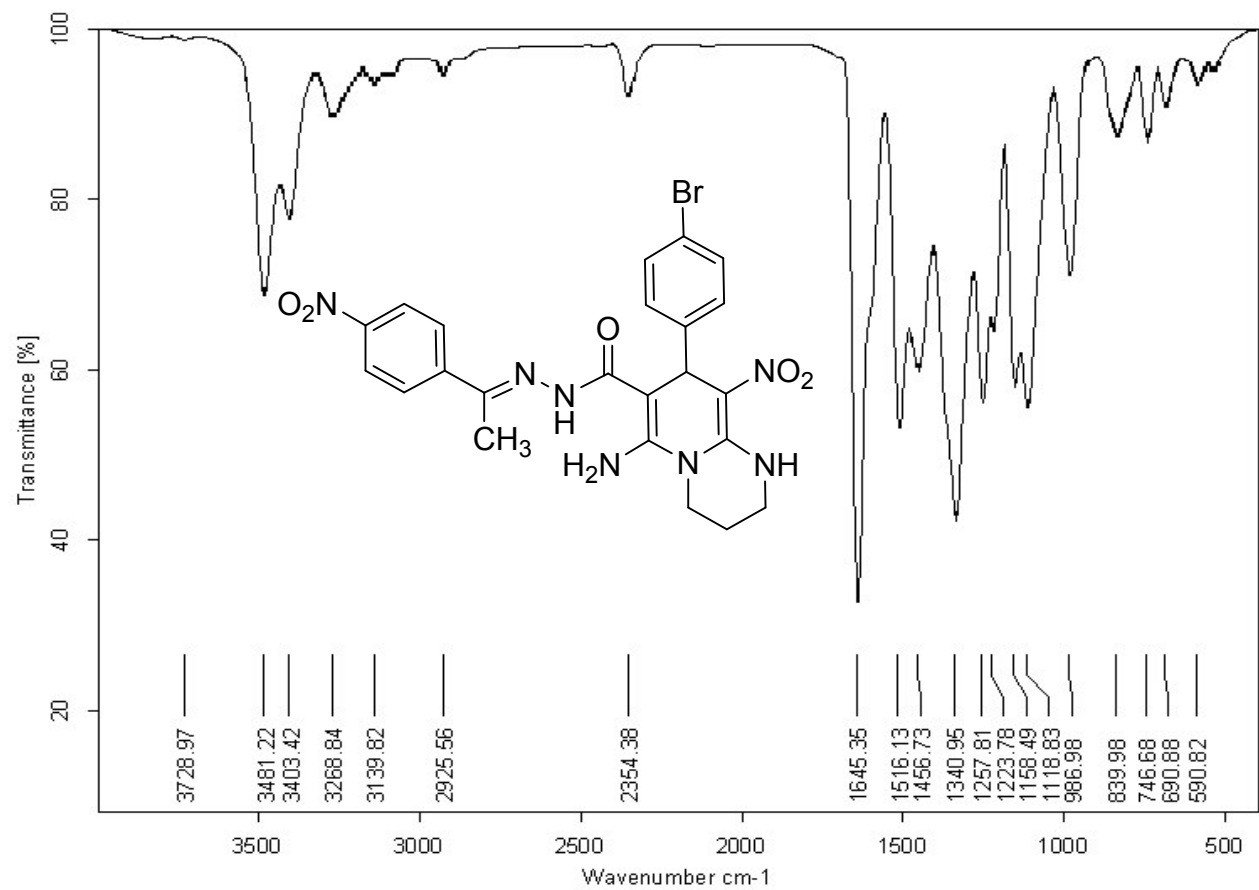


¹H NMR of 6h

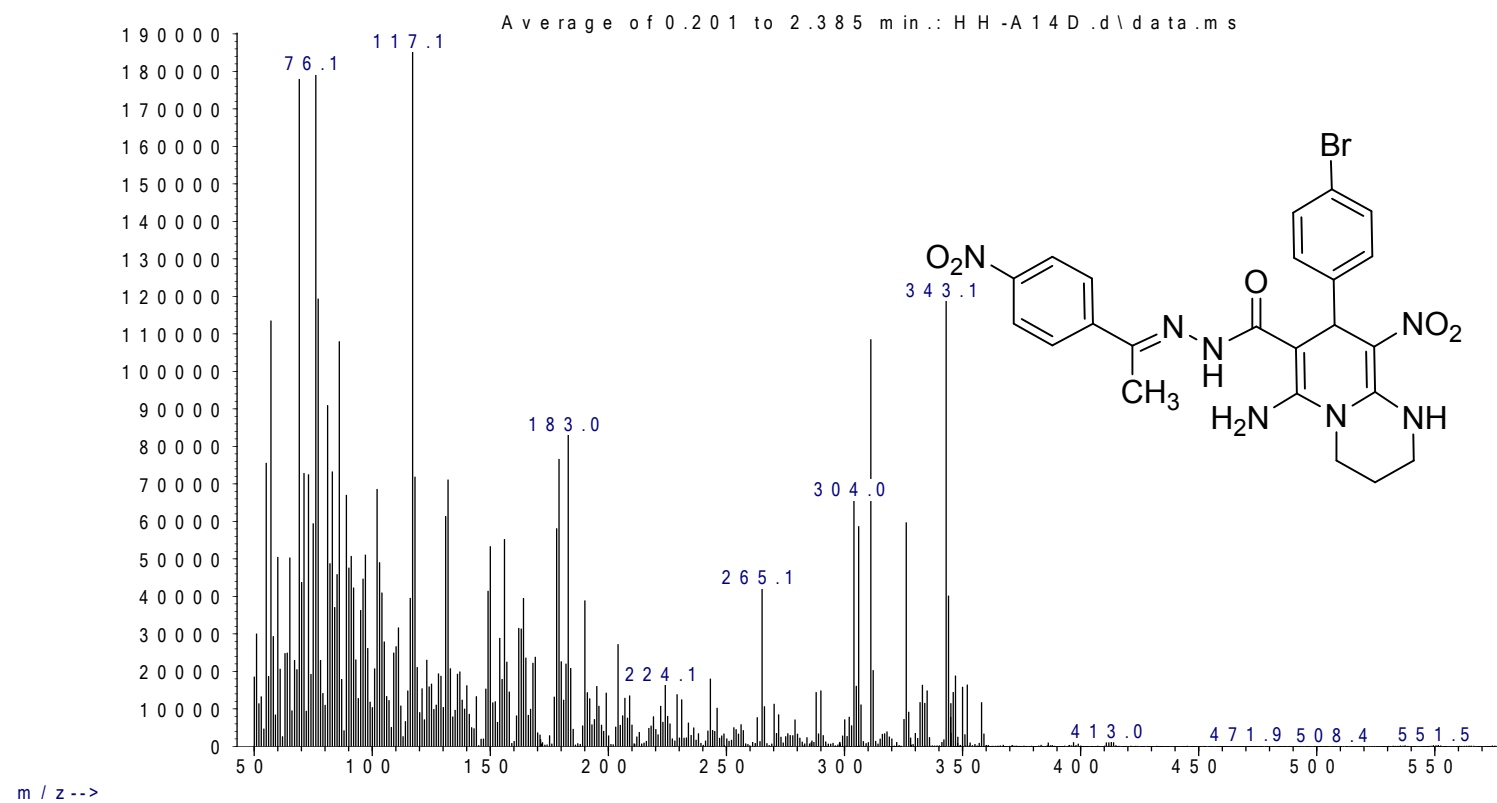
¹³C NMR of 6h

**¹H NMR of 6i**

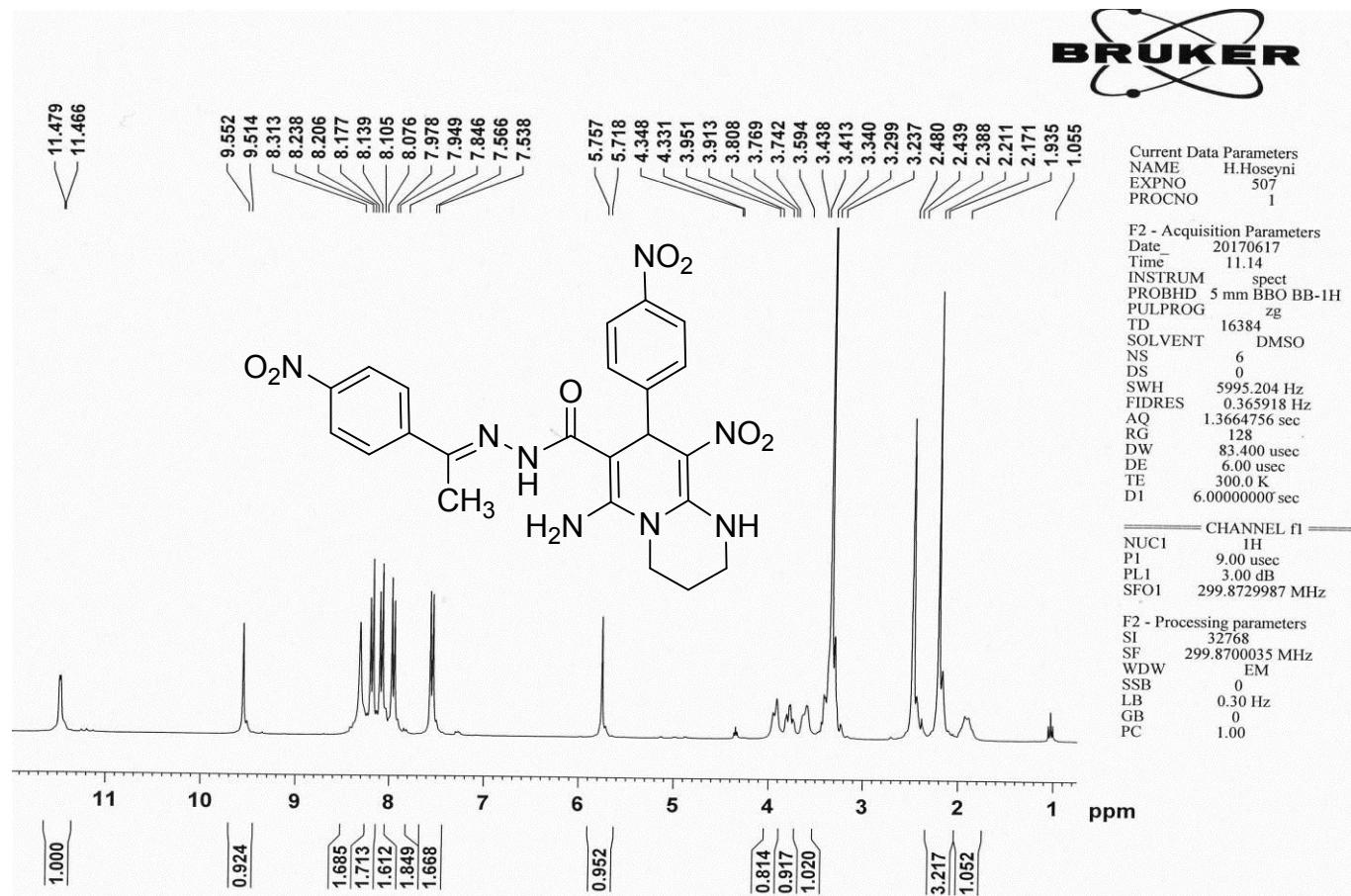


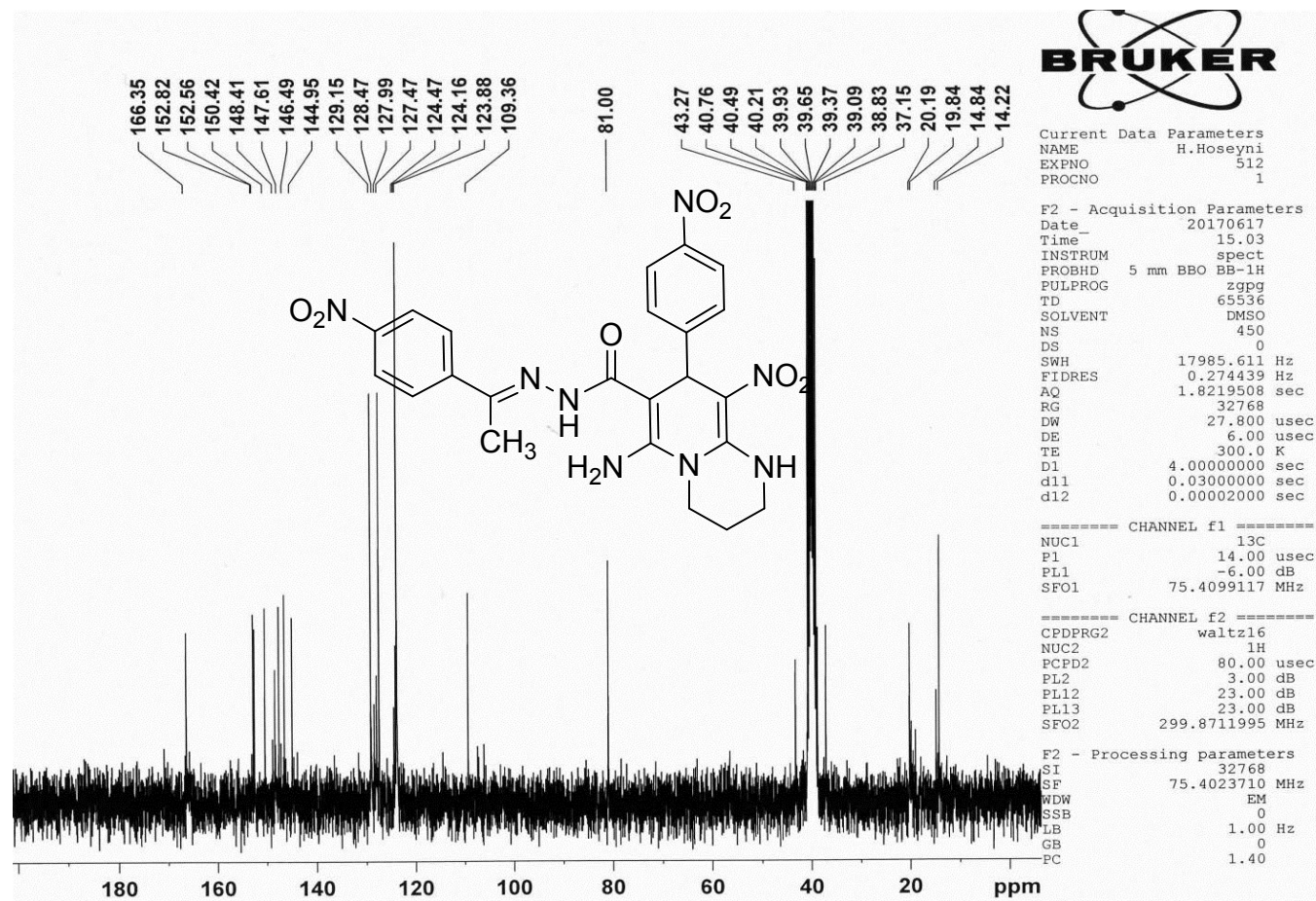
**IR of 6i**

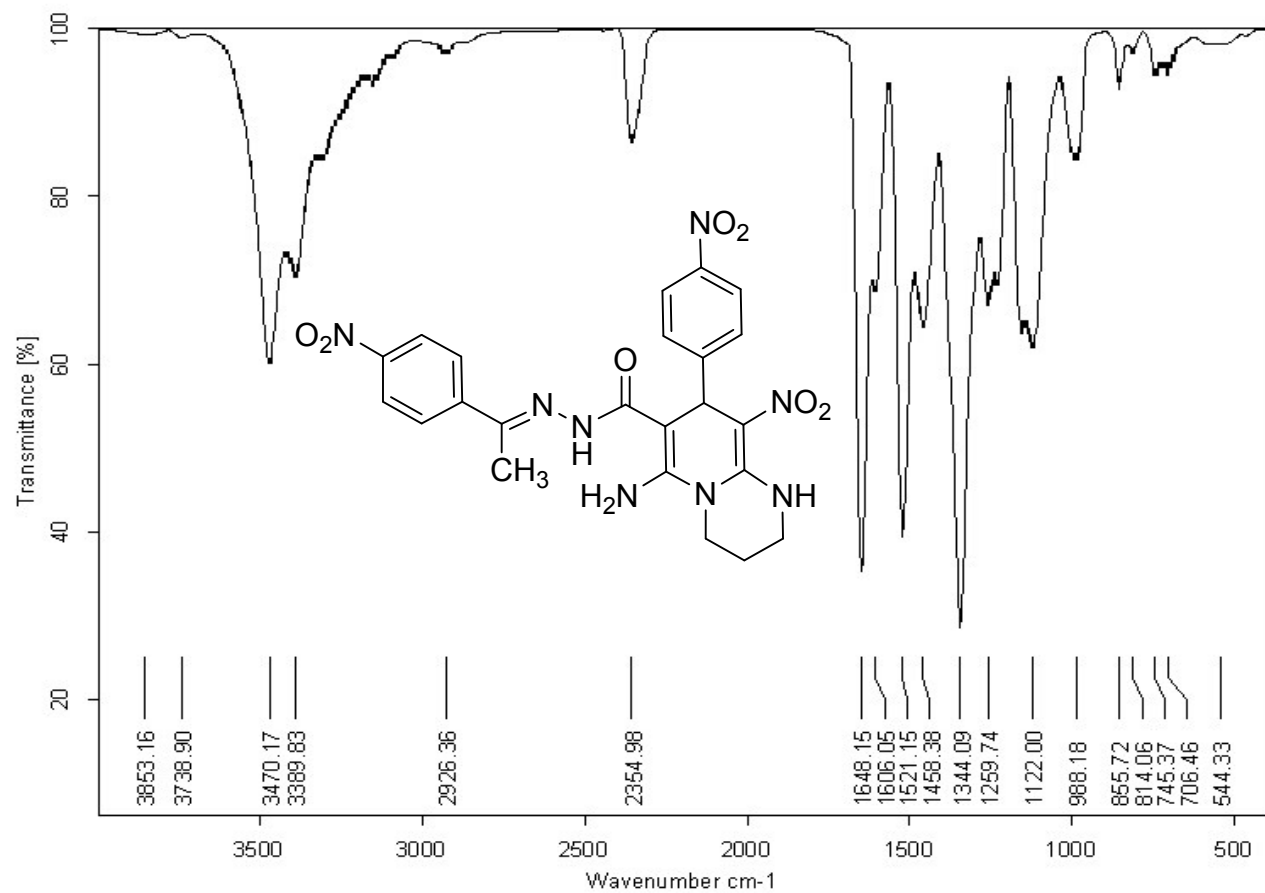
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MS of 6i

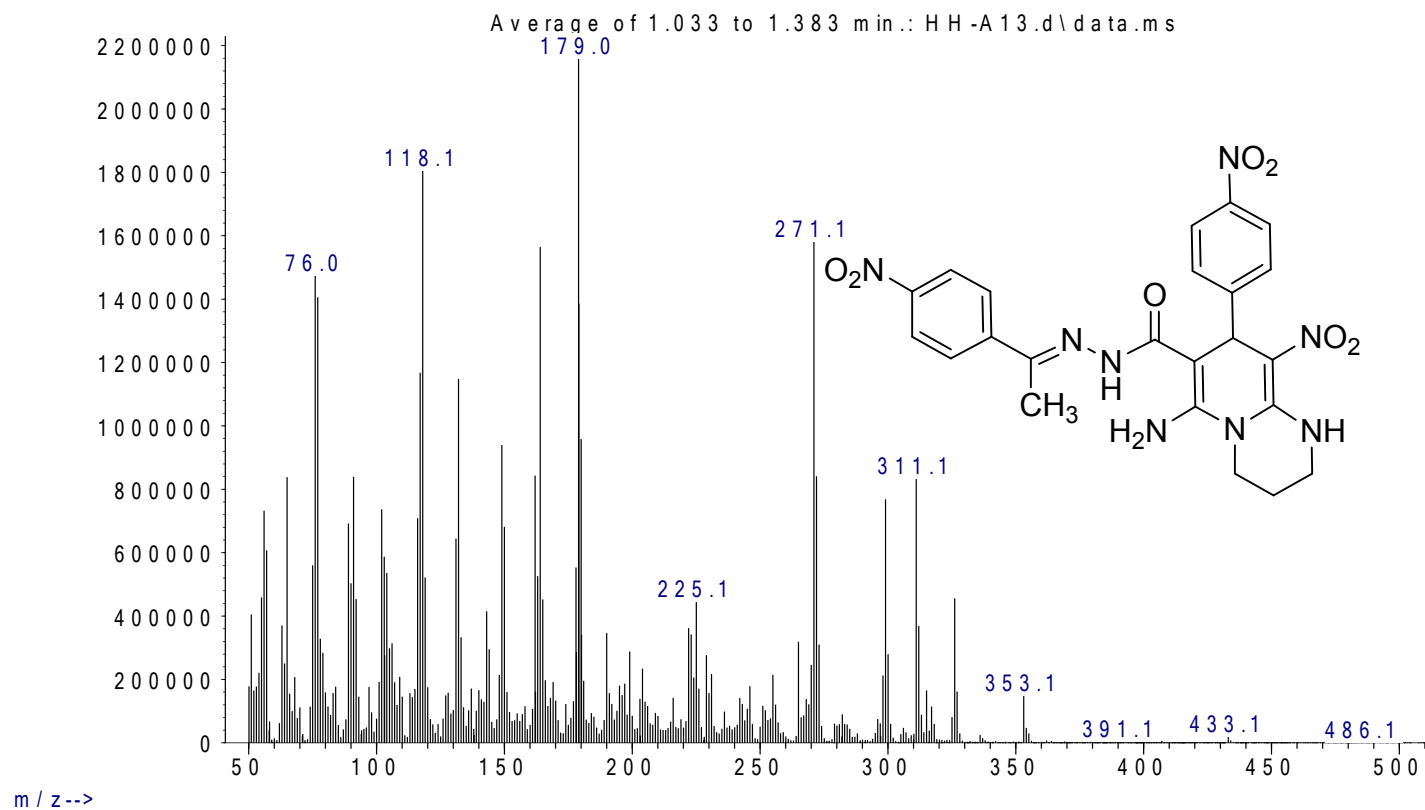
¹H NMR of 6j

¹³C NMR of 6j

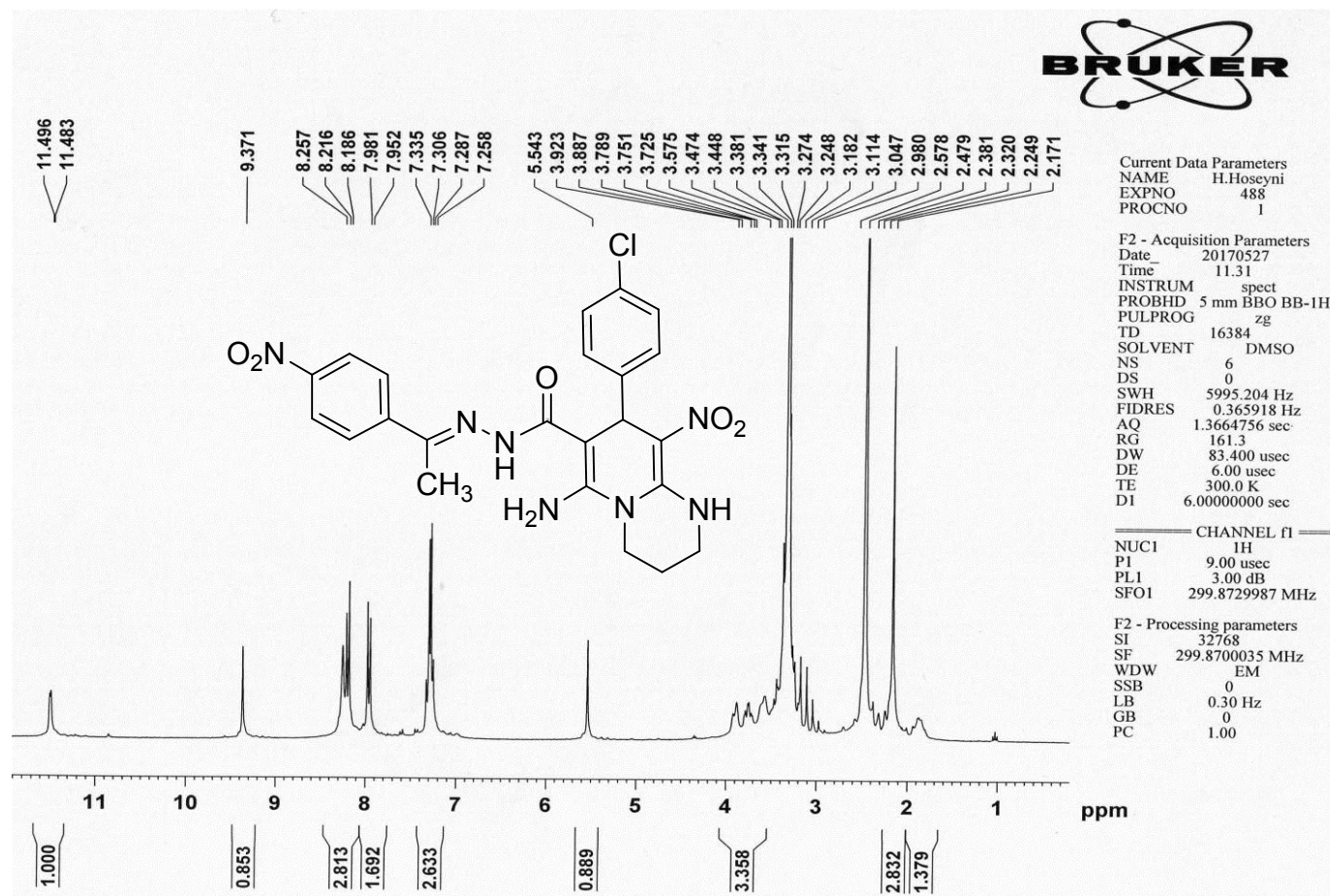


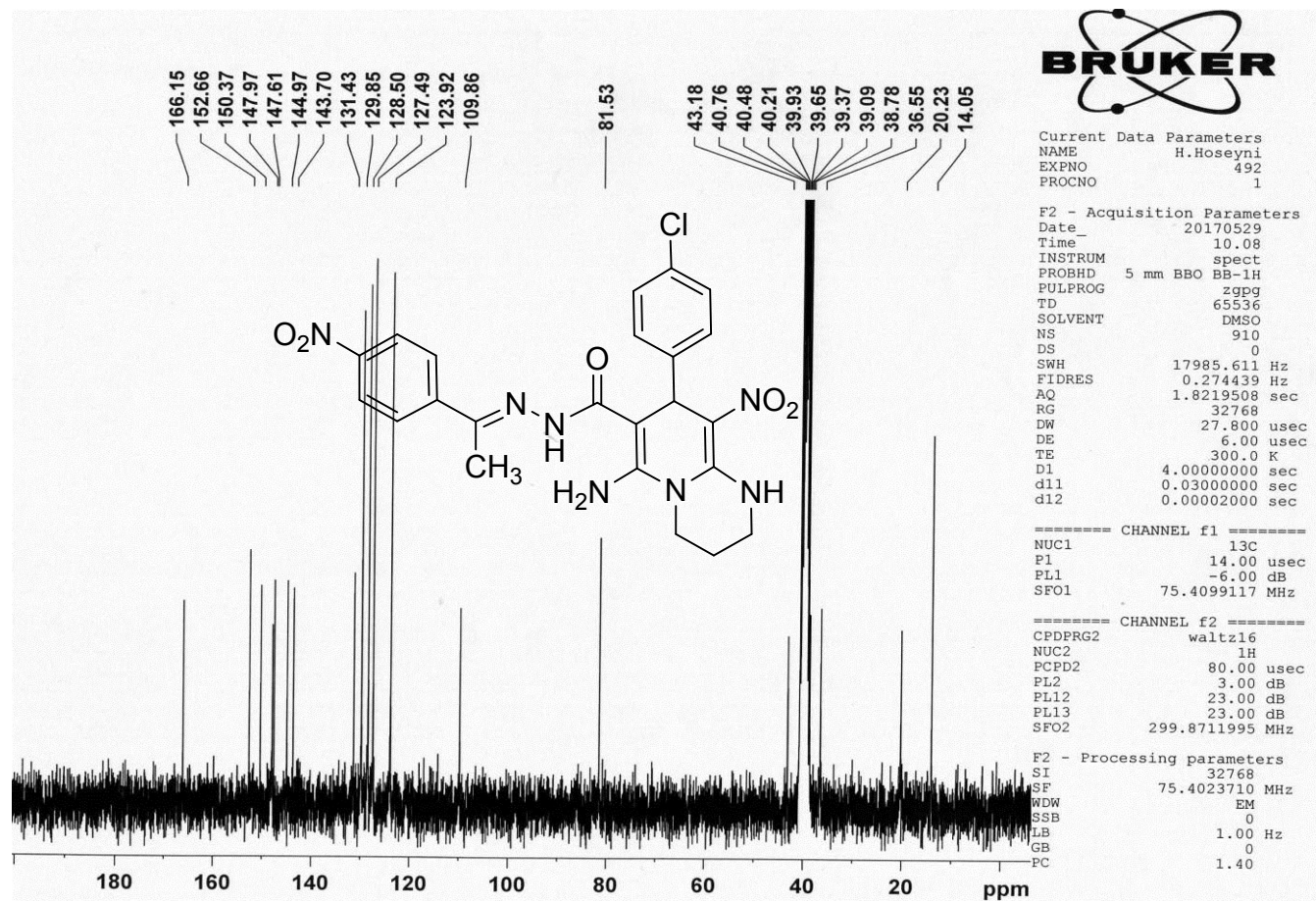
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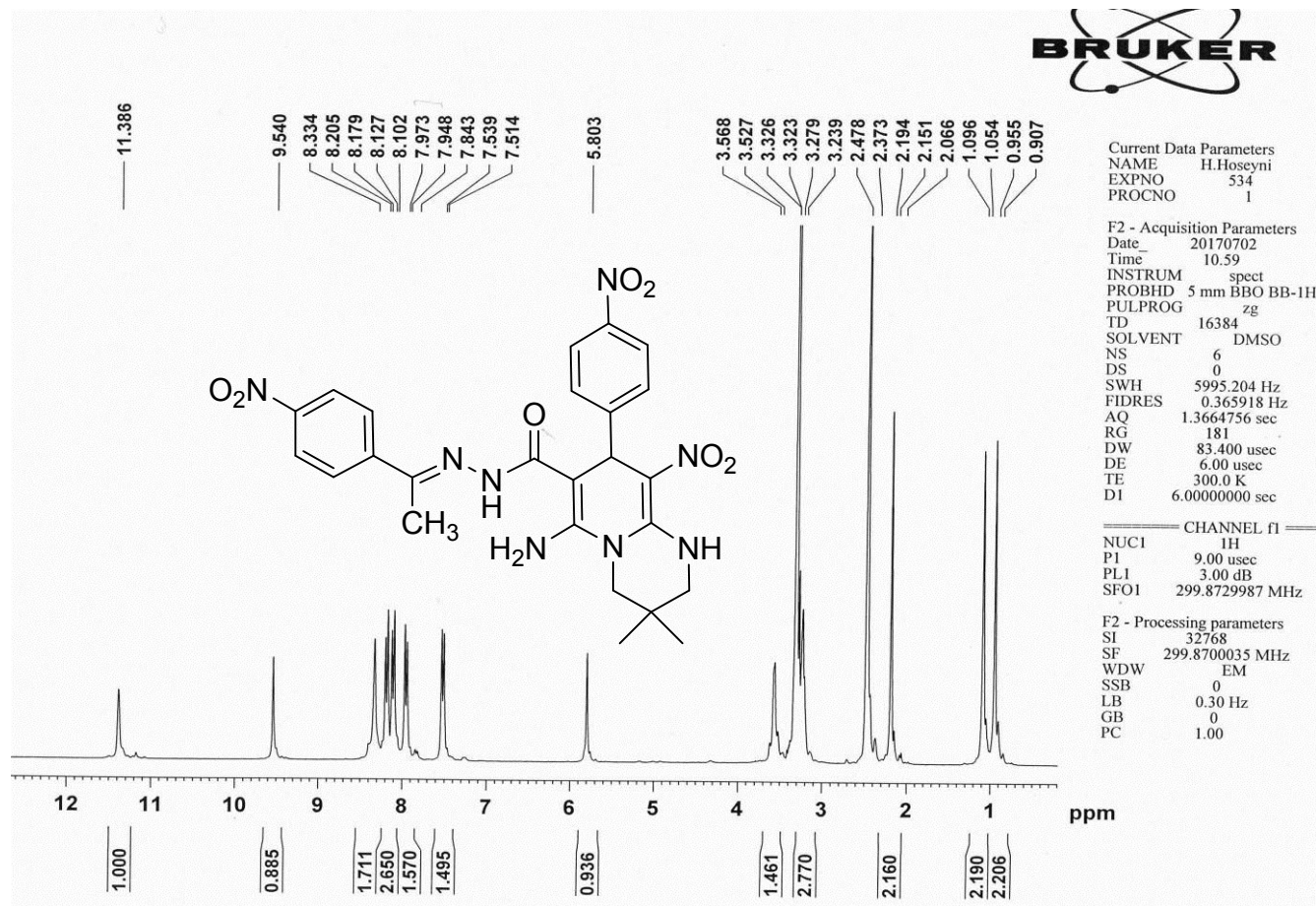
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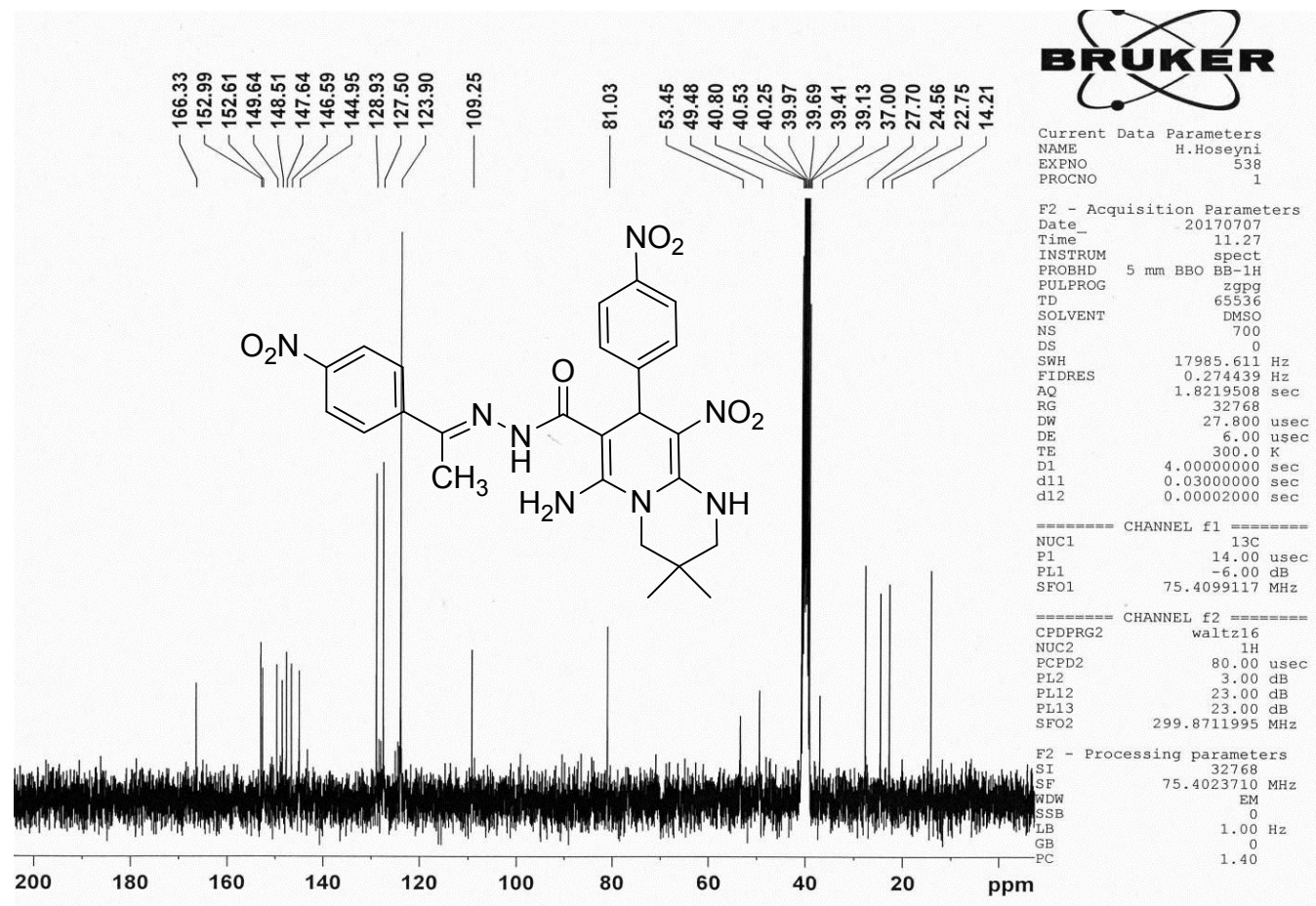


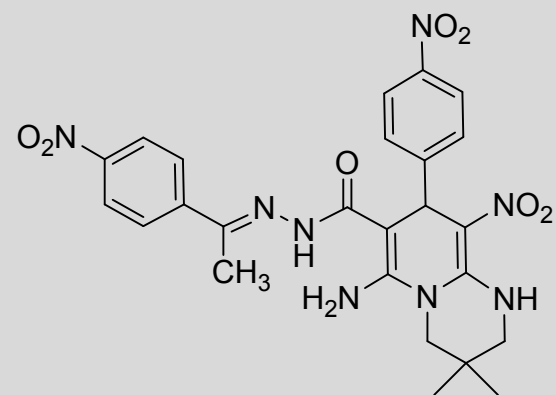
MS of 6j

¹H NMR of 6k

 ^{13}C NMR of 6k

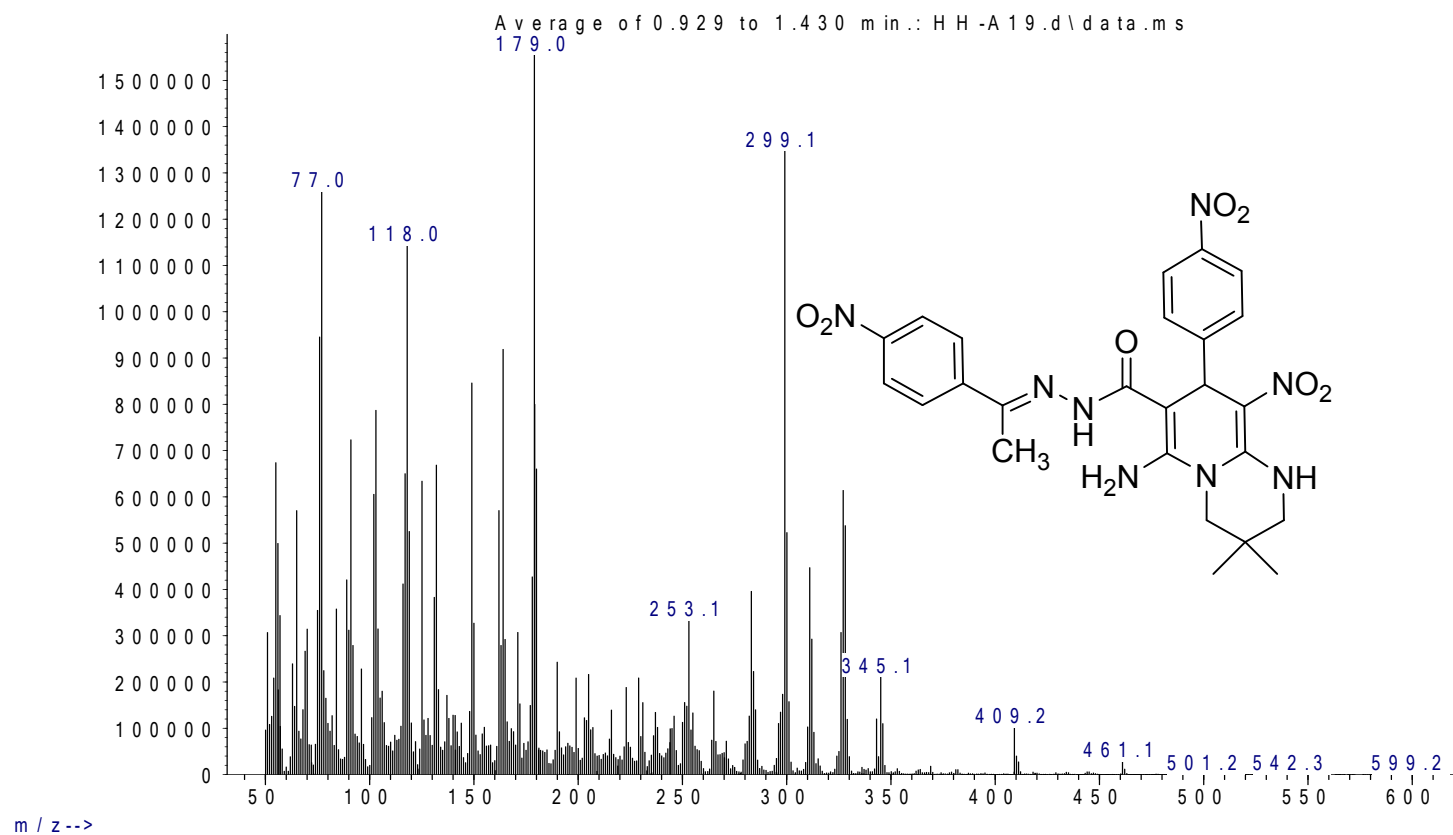
¹H NMR of **6l**



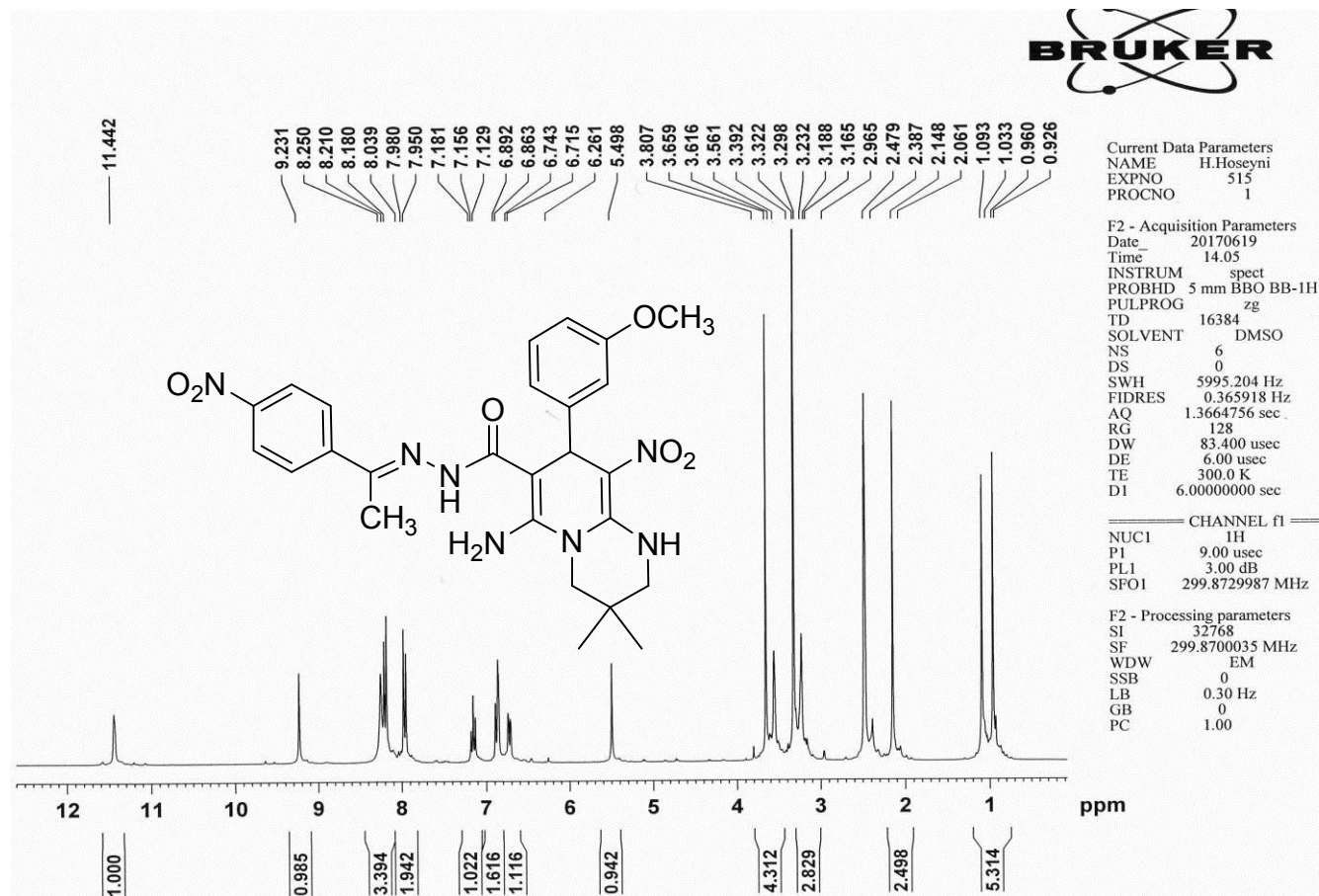


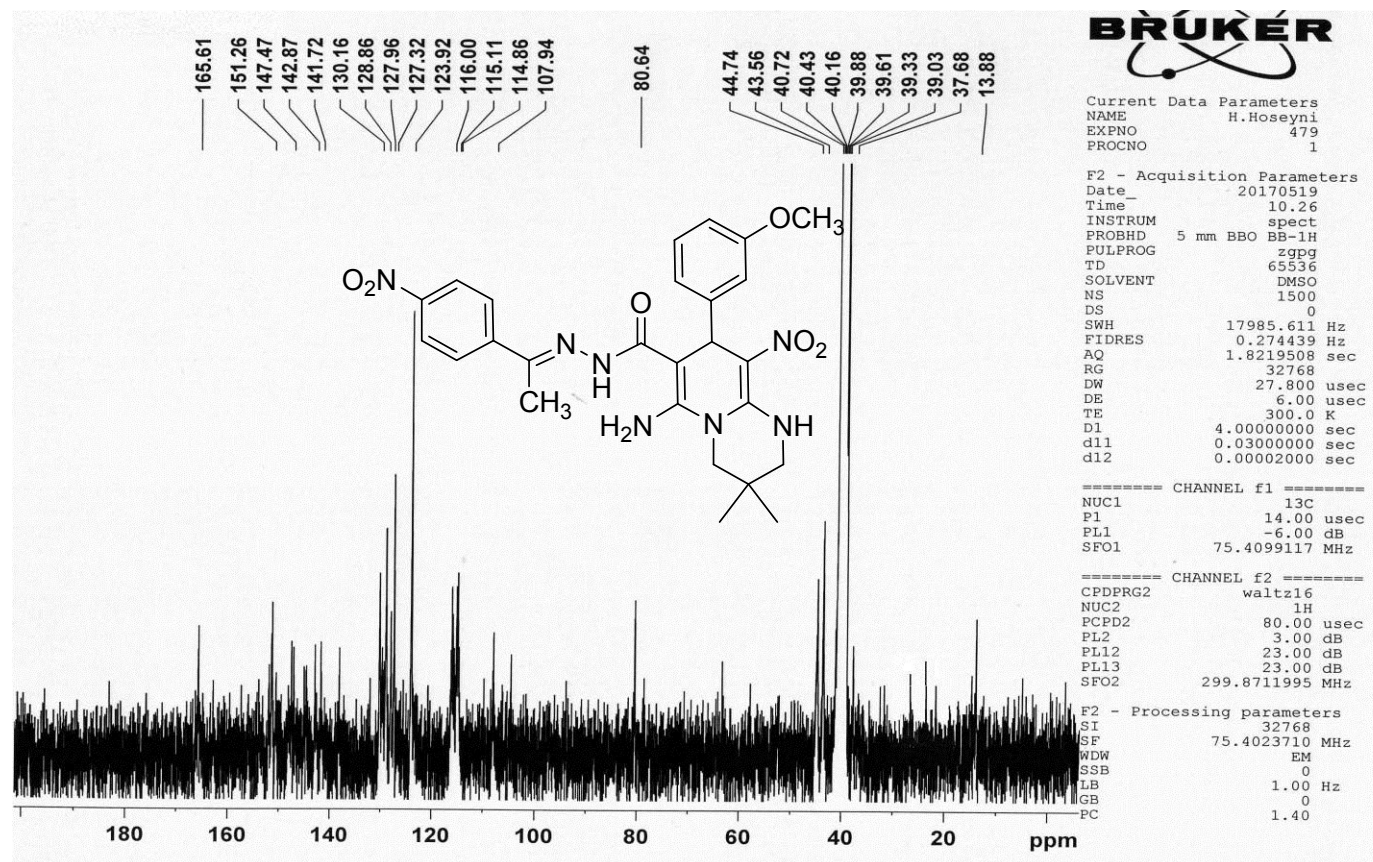
IR of 6l

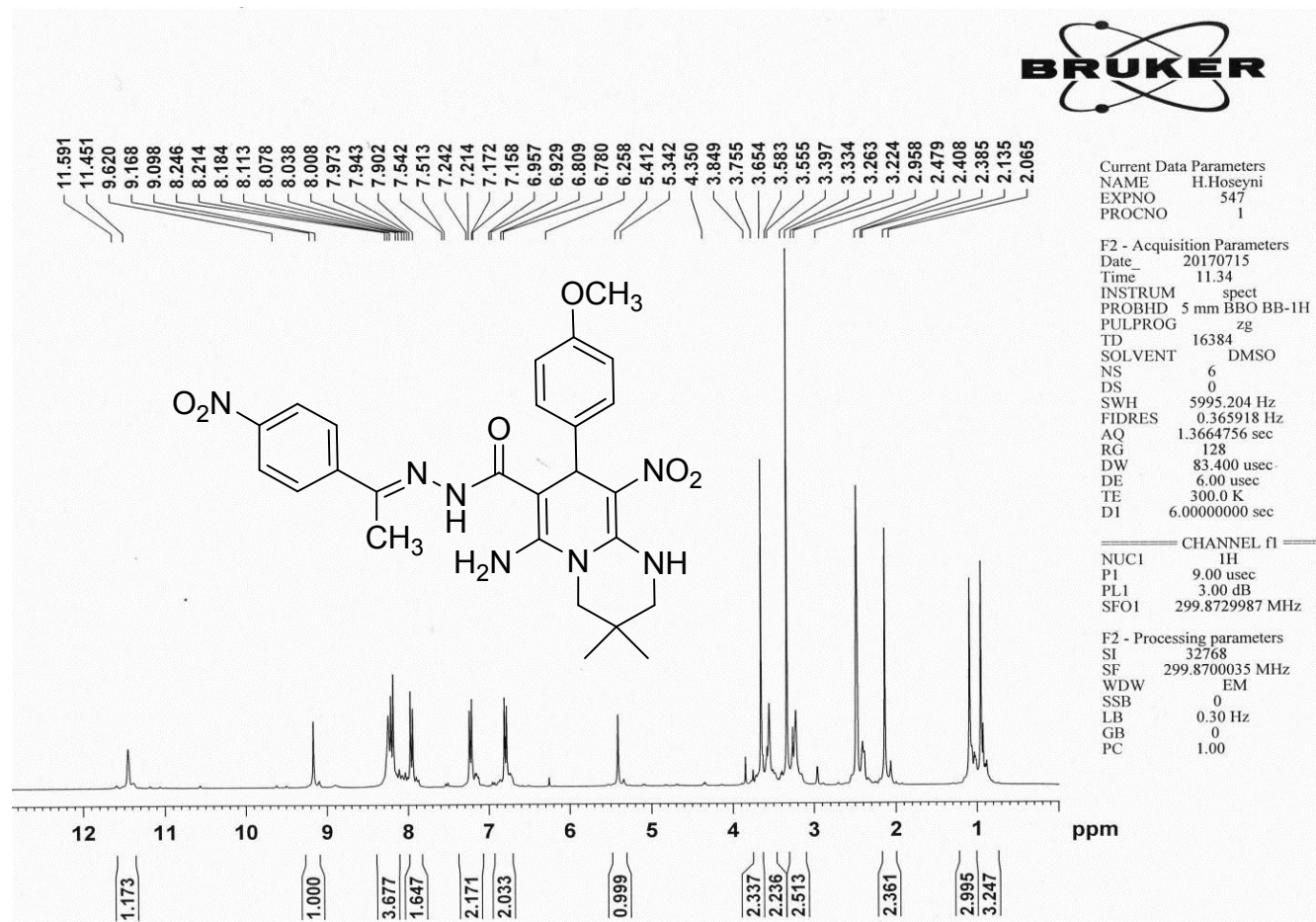
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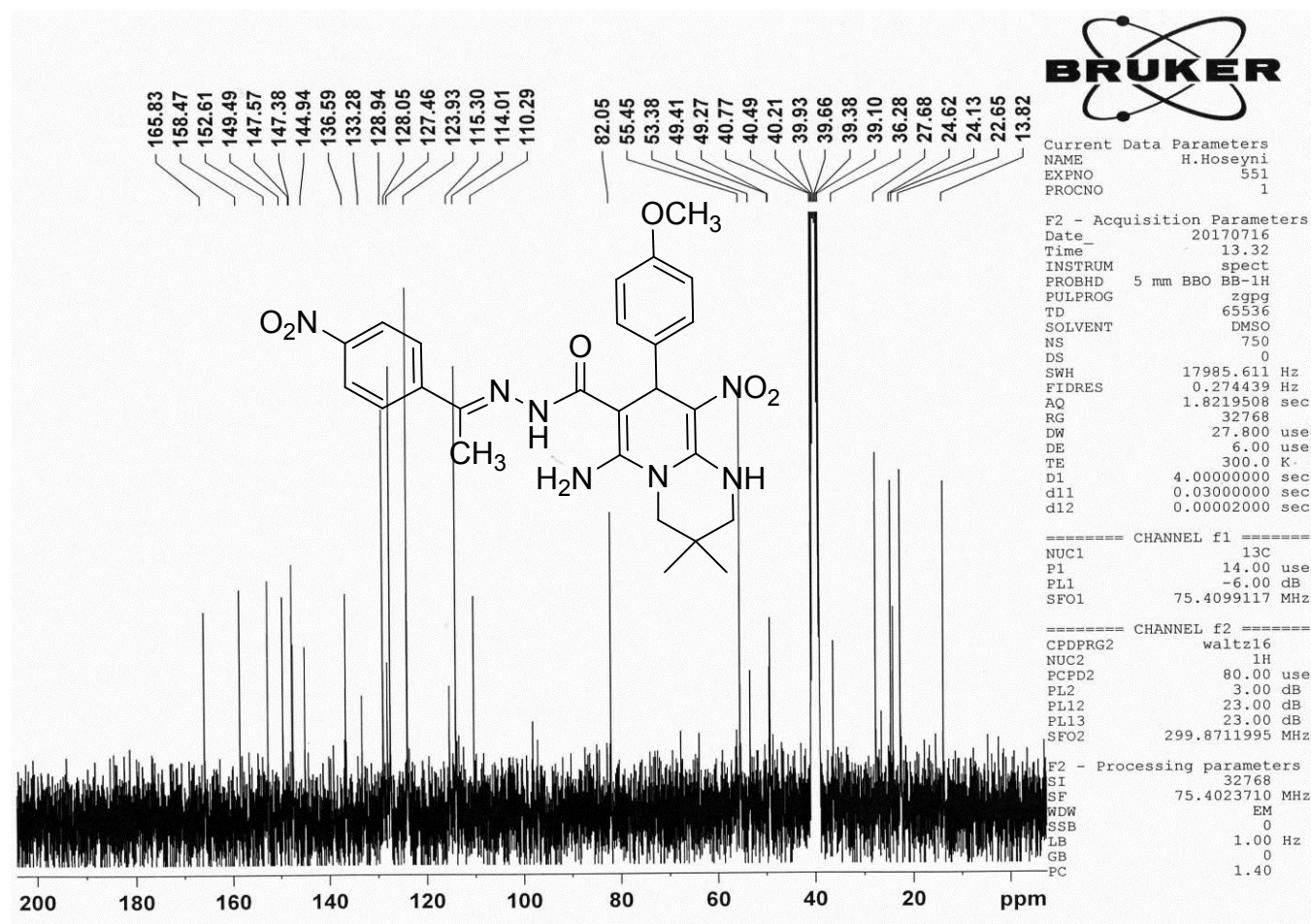


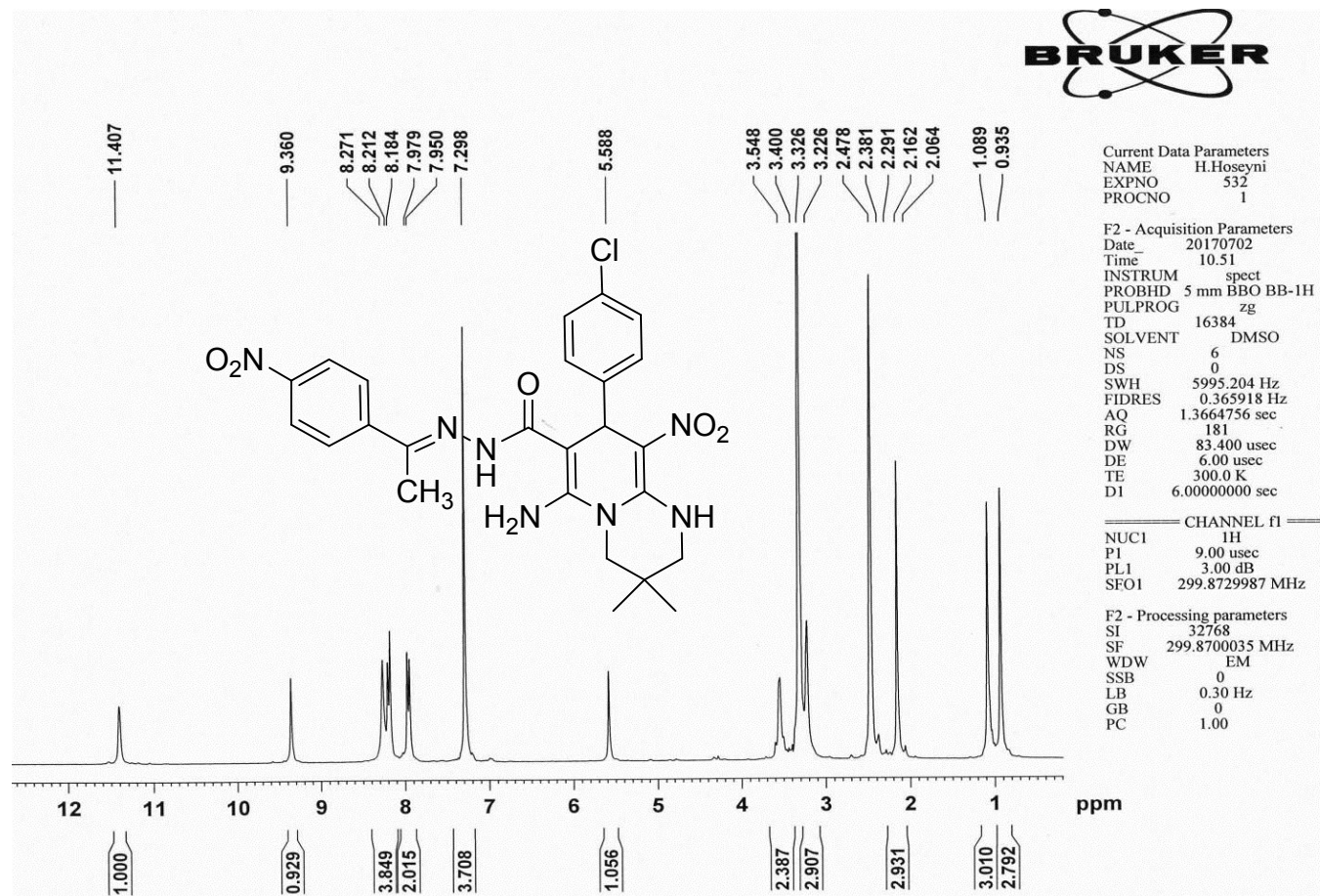
MS of 61

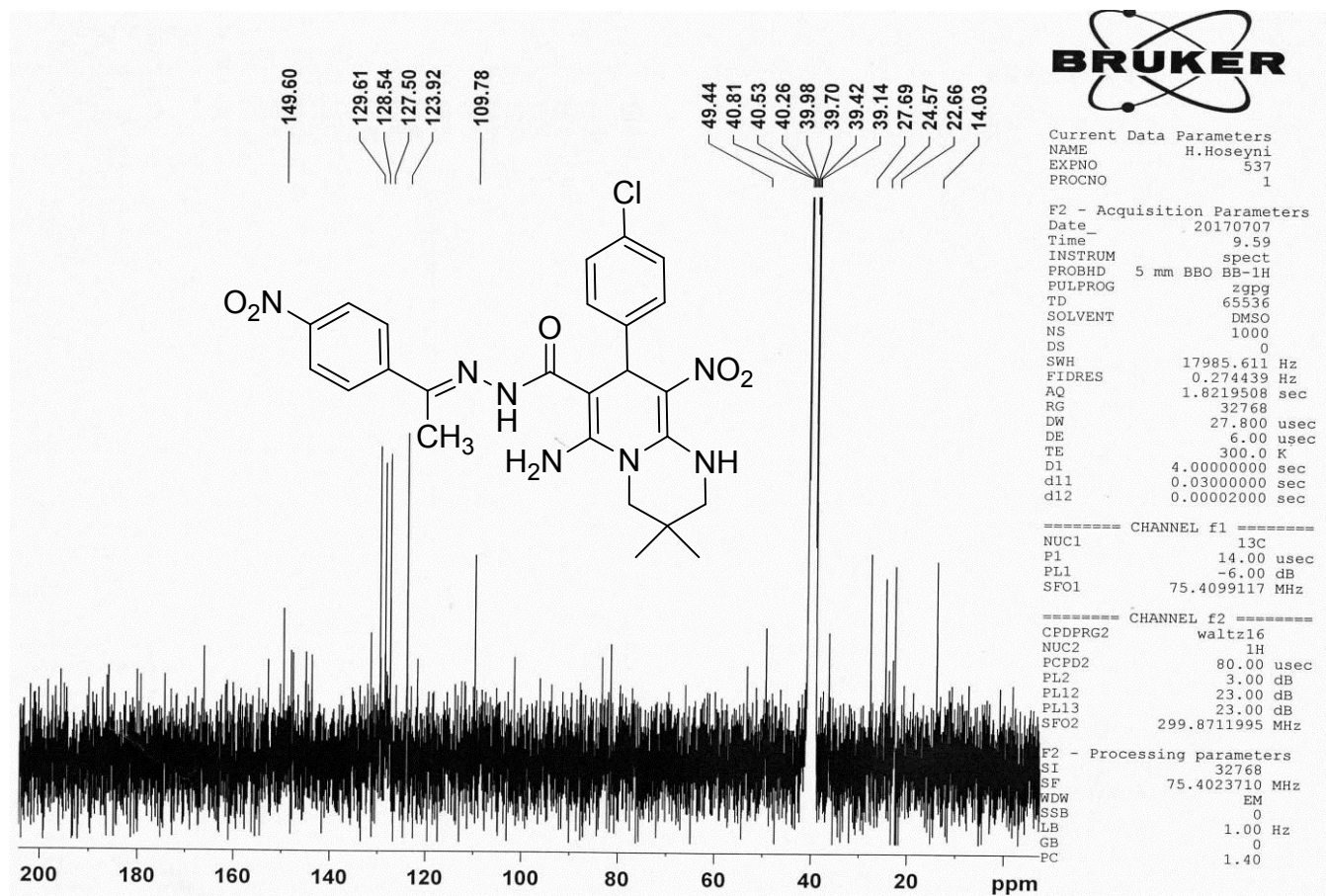
¹H NMR of 6m

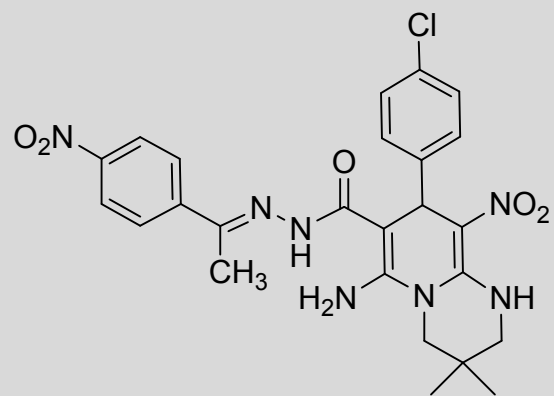


**¹H NMR of 6n**

¹³C NMR of 6n

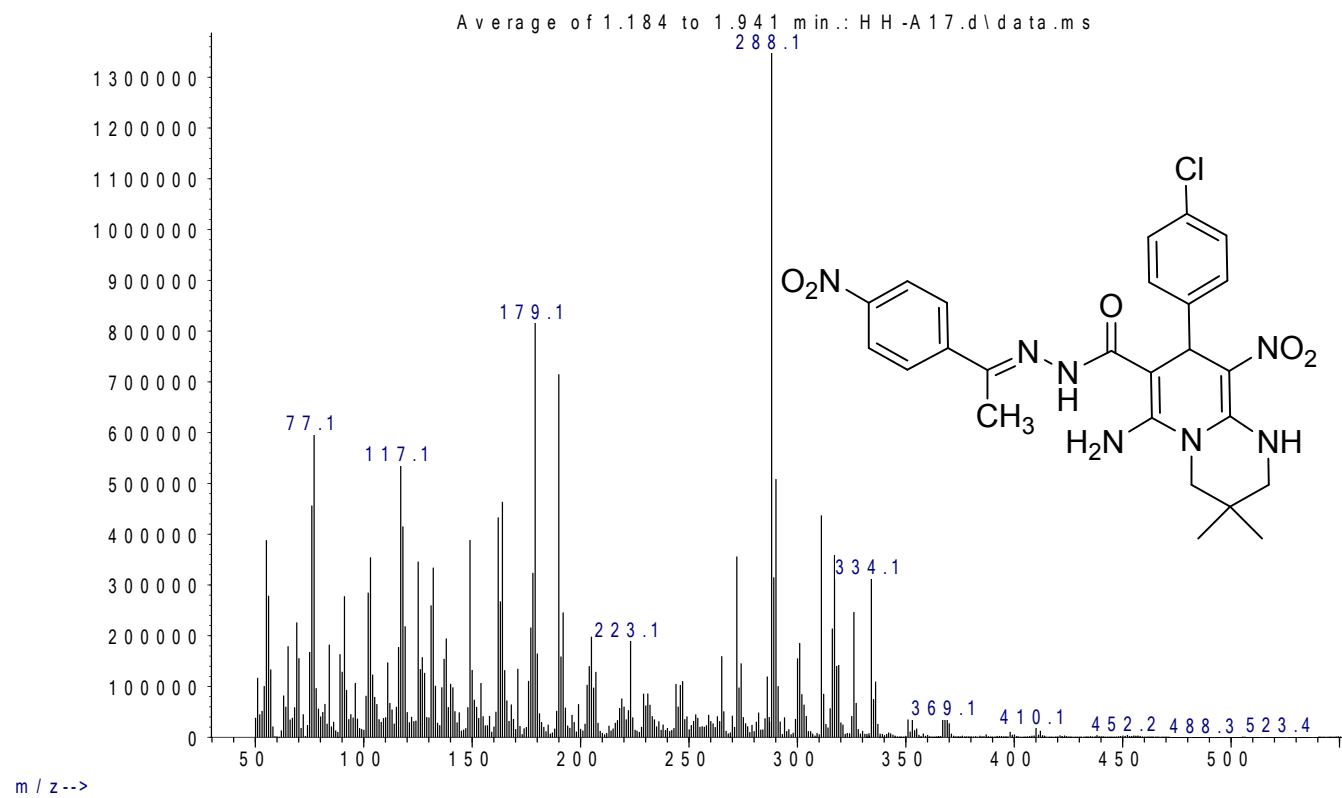
 ^1H NMR of 60

**¹³C NMR of 60**

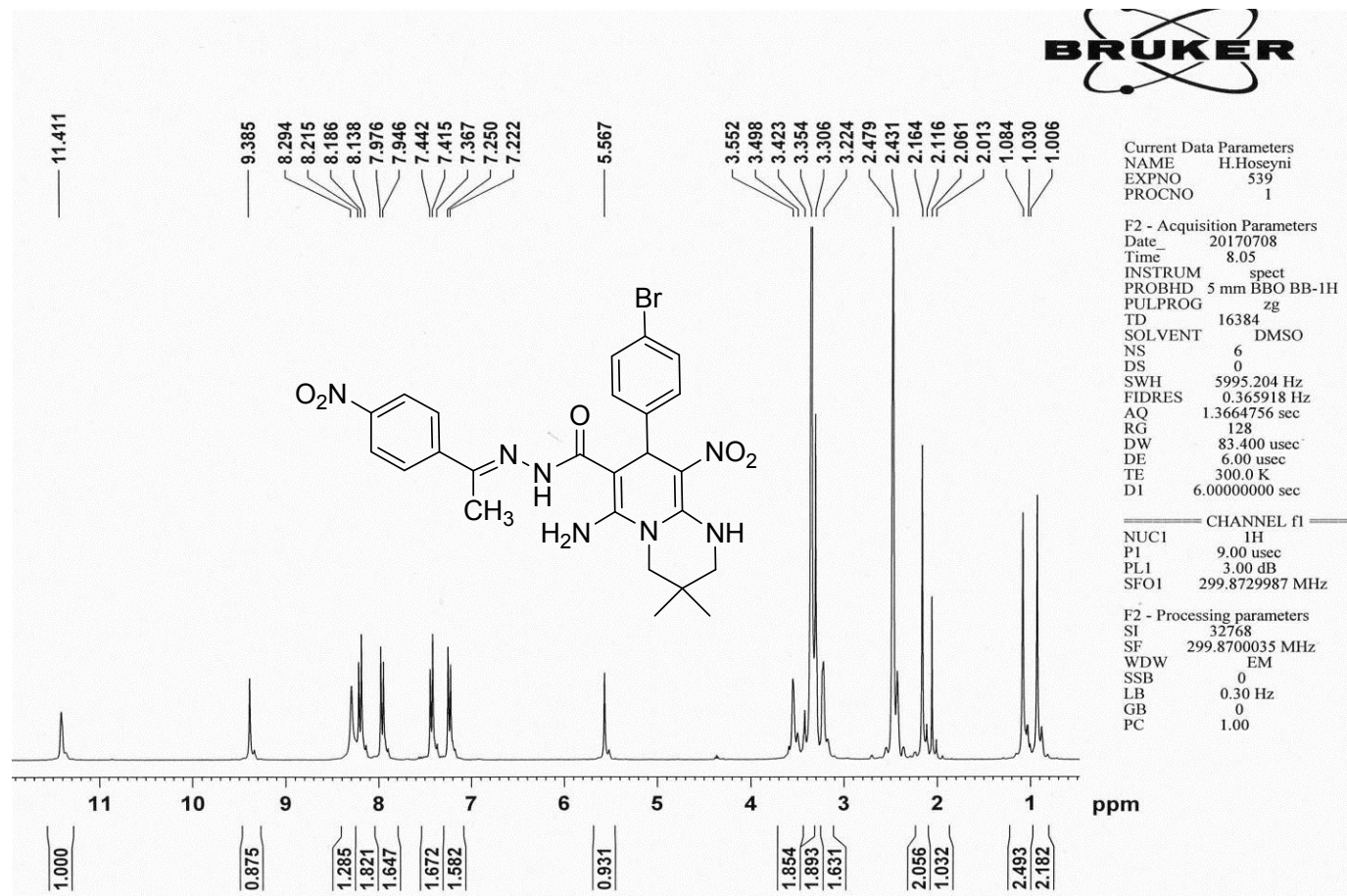


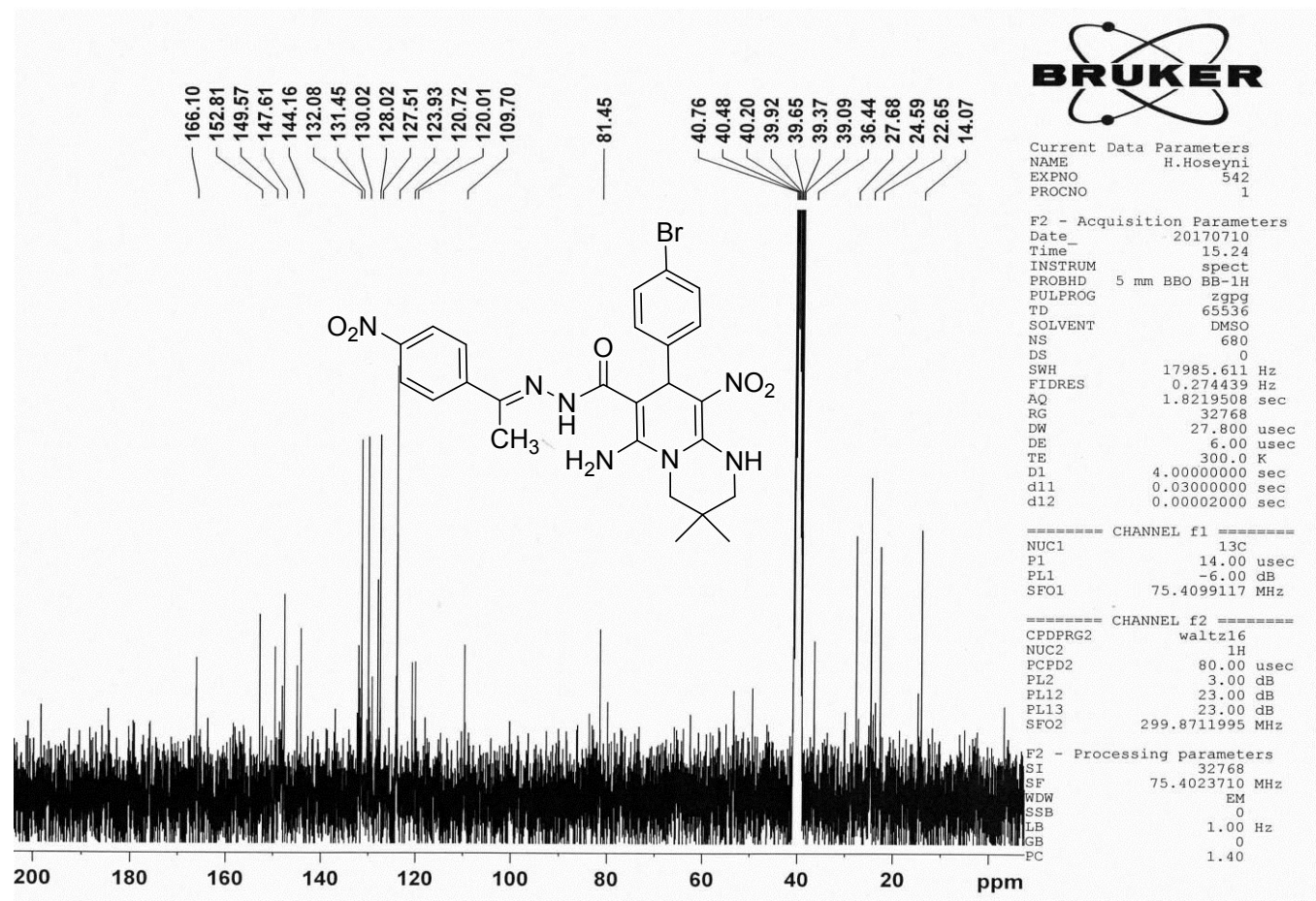
IR of 6o

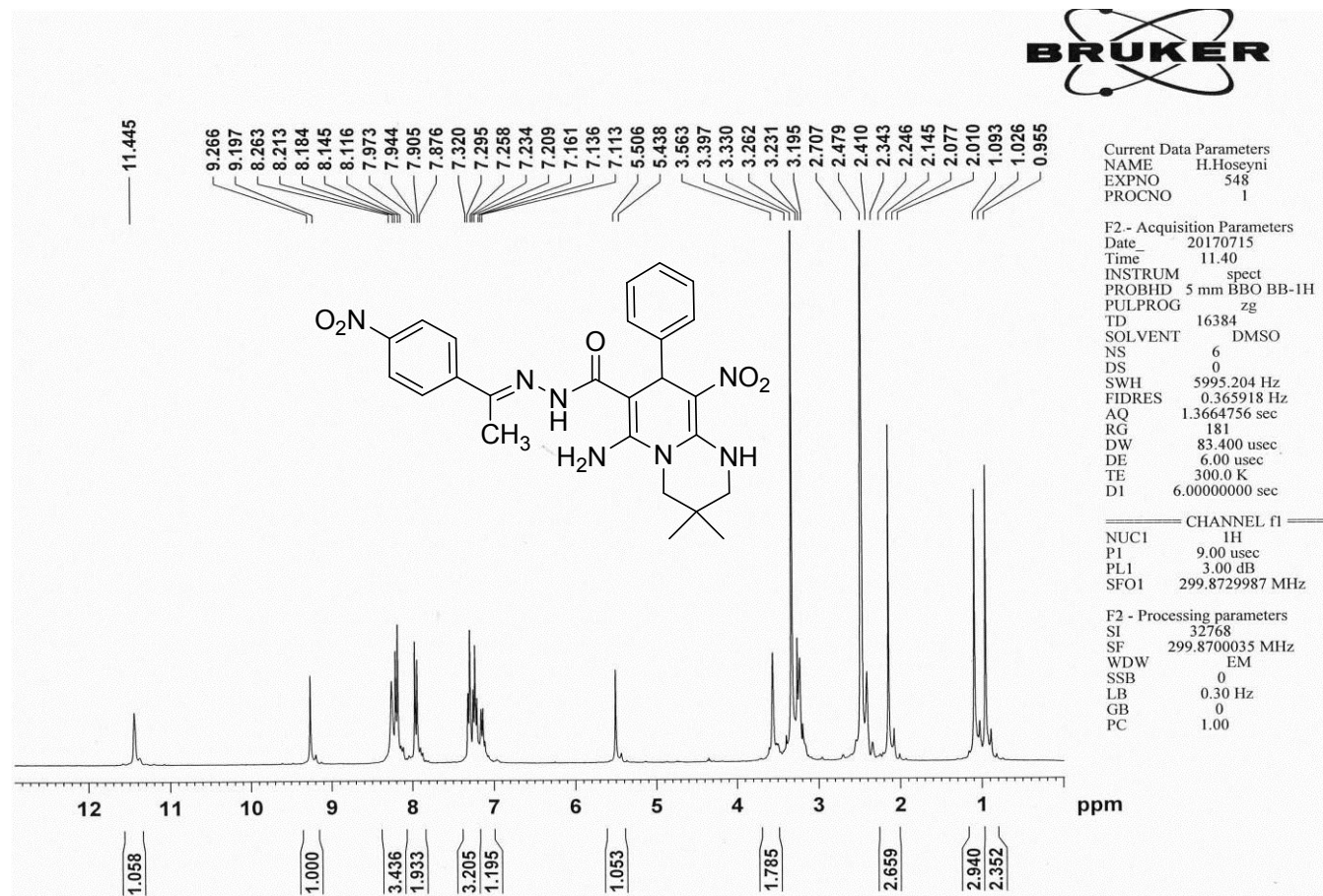
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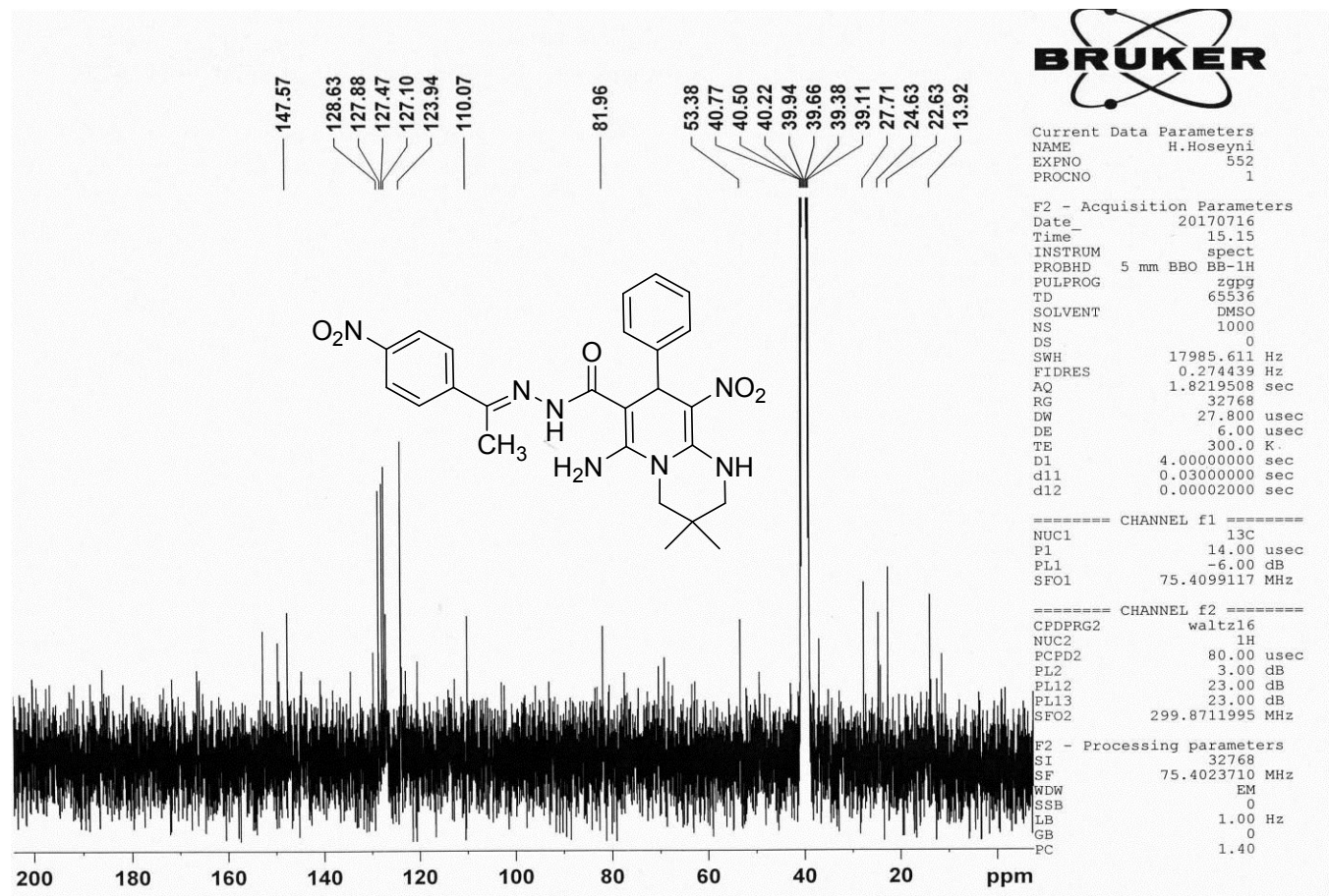
MS of 60

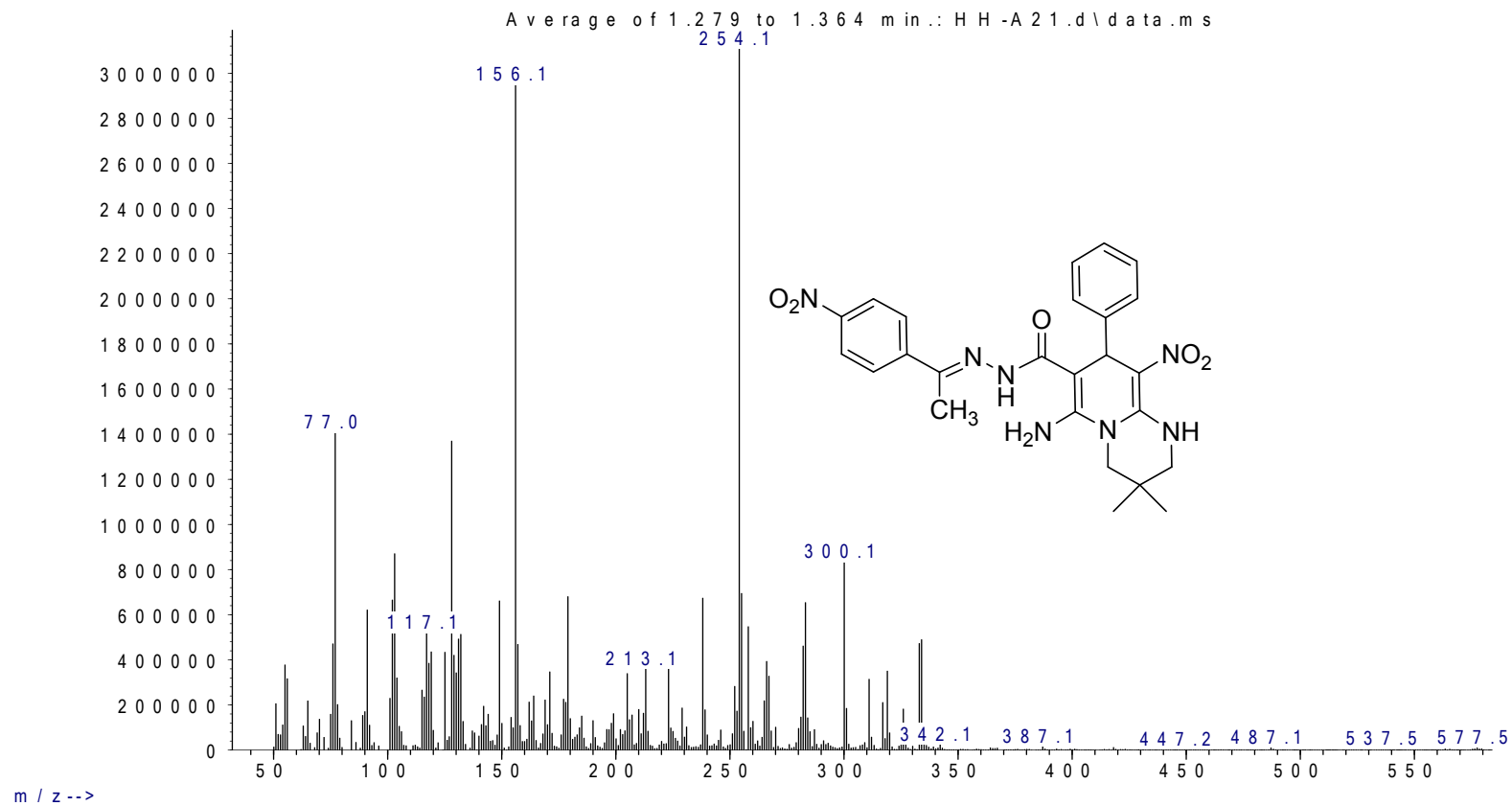
¹H NMR of 6p





¹H NMR of 6q





MS of 6q