

Supporting Information

Synthesis of pluri-functional amine hardeners from bio-based aromatic aldehydes for epoxy amine thermosets

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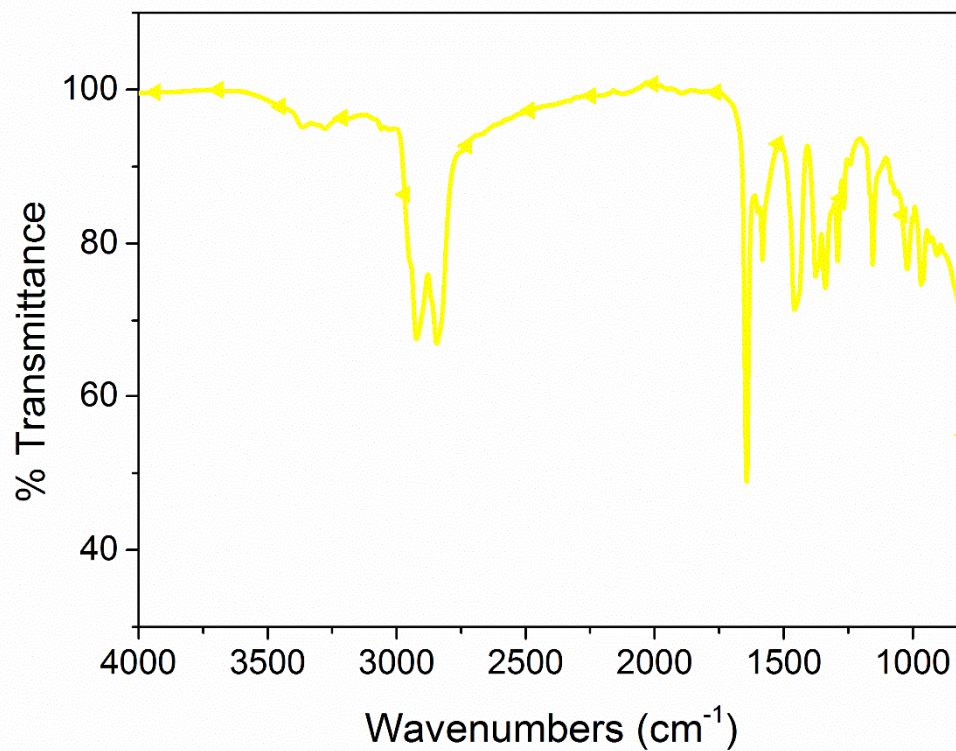
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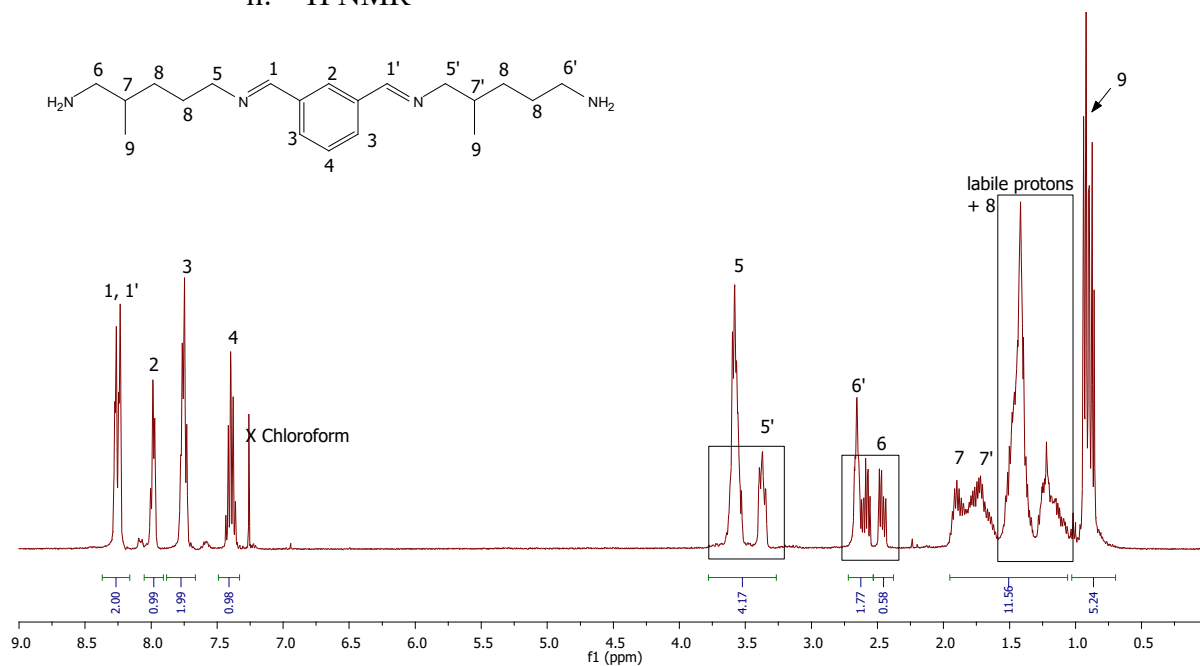
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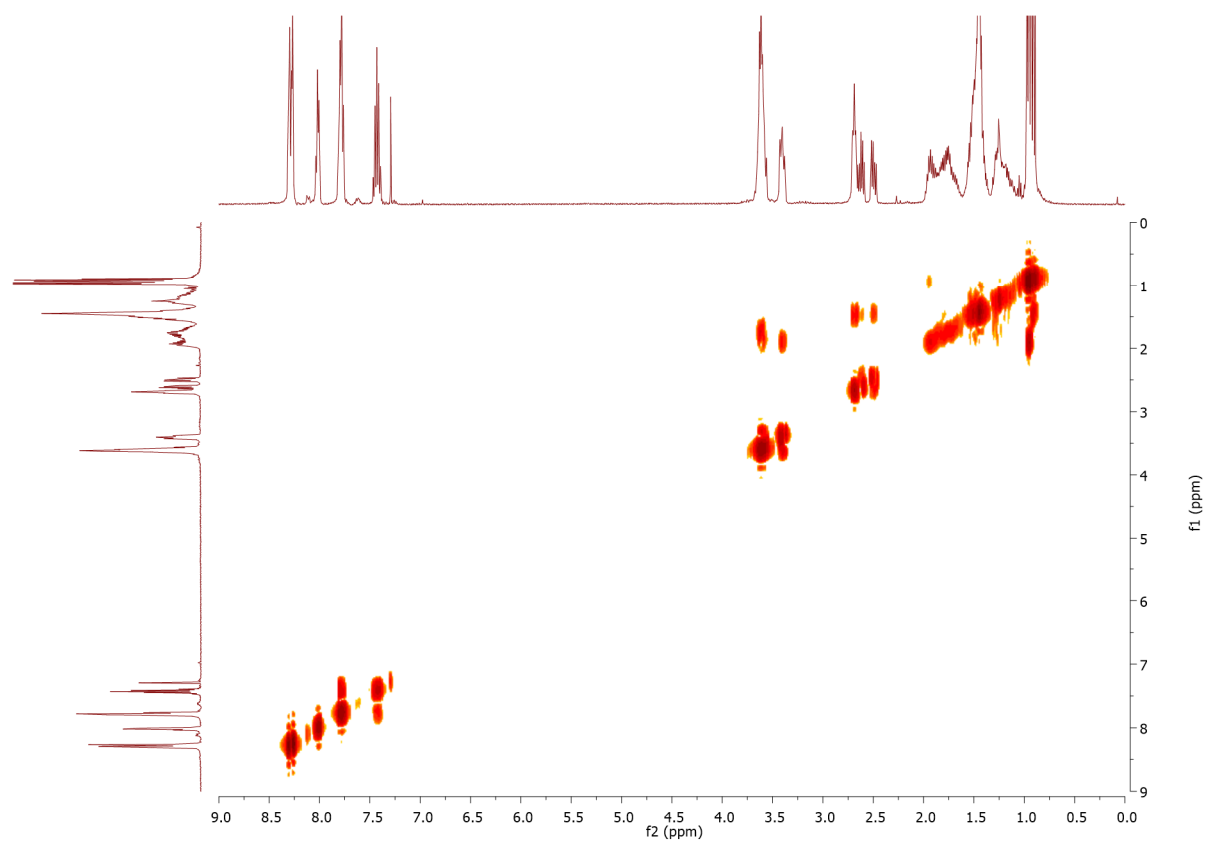
1. IPTA characterizations
 - a. Imine
 - i. FT-IR



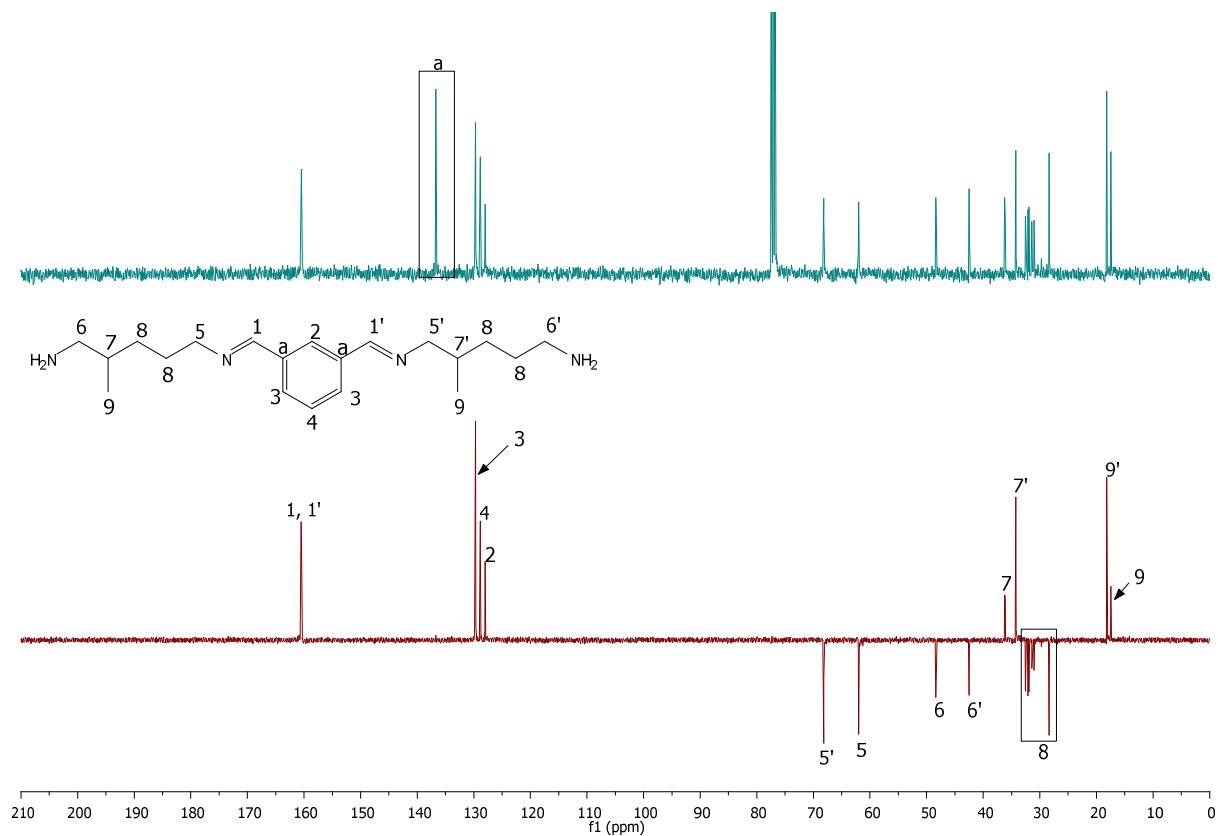
- ii. ^1H NMR



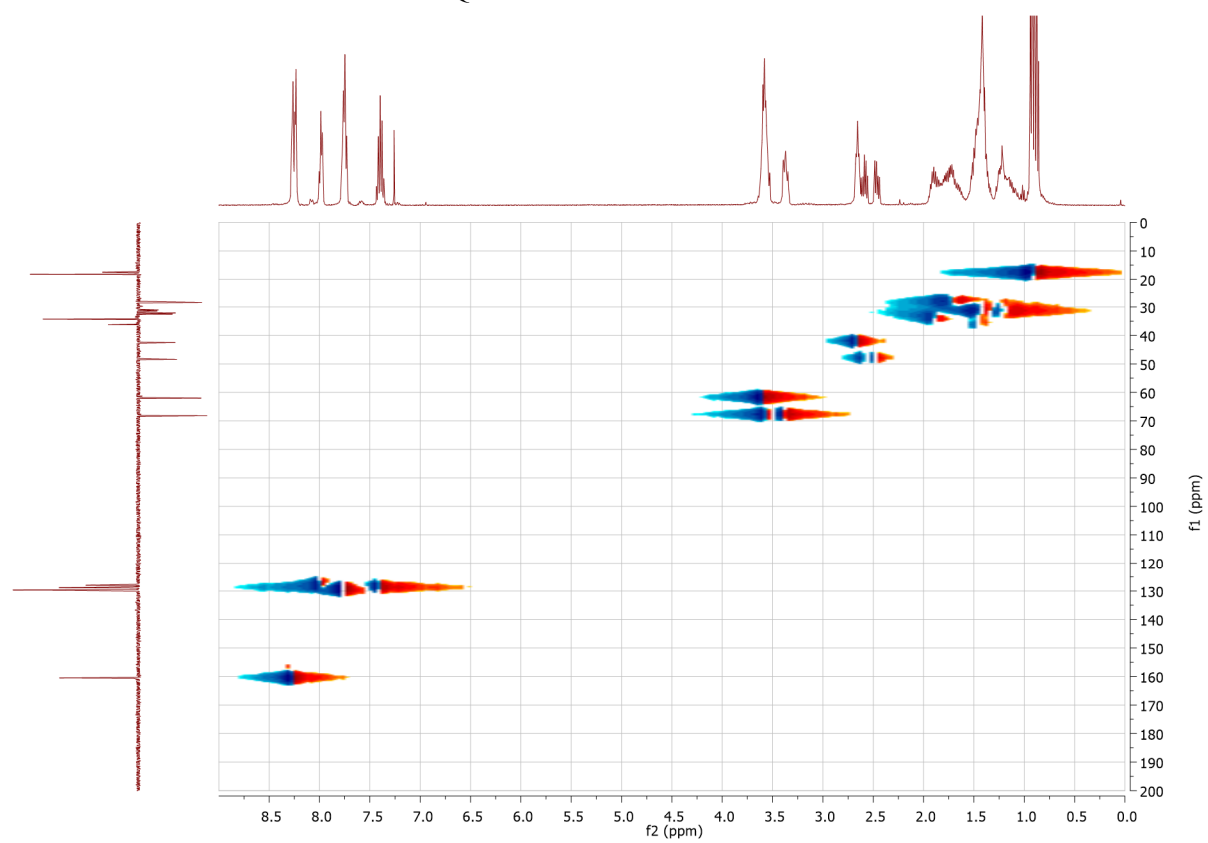
iii. $^1\text{H} - ^1\text{H}$ COSY NMR



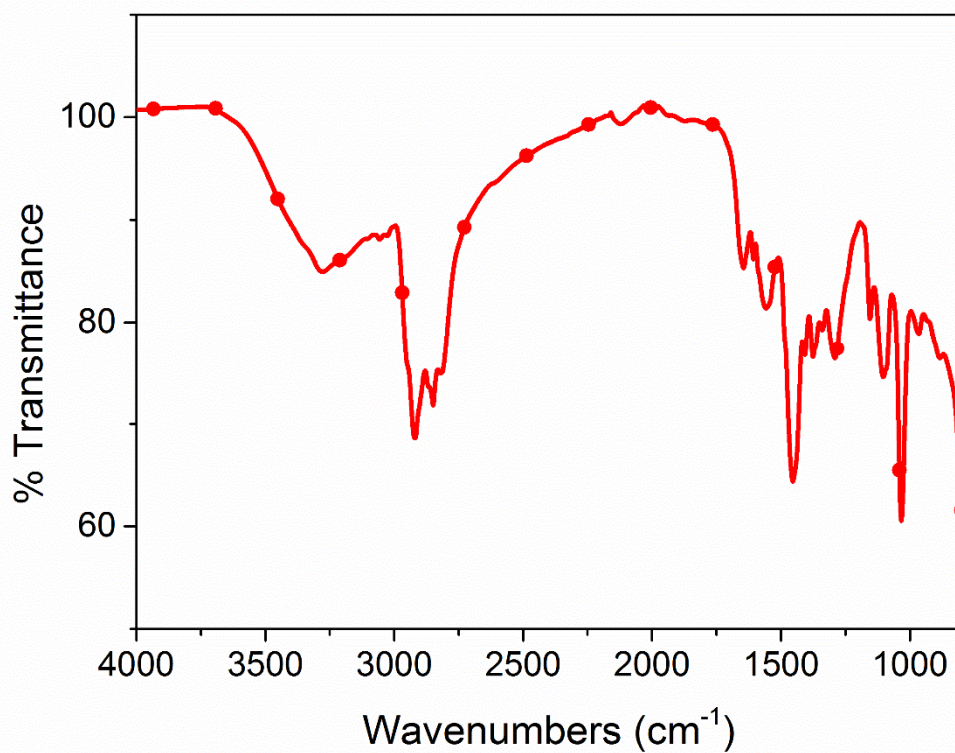
iv. ^{13}C (up) and DEPT 135 (down) NMR



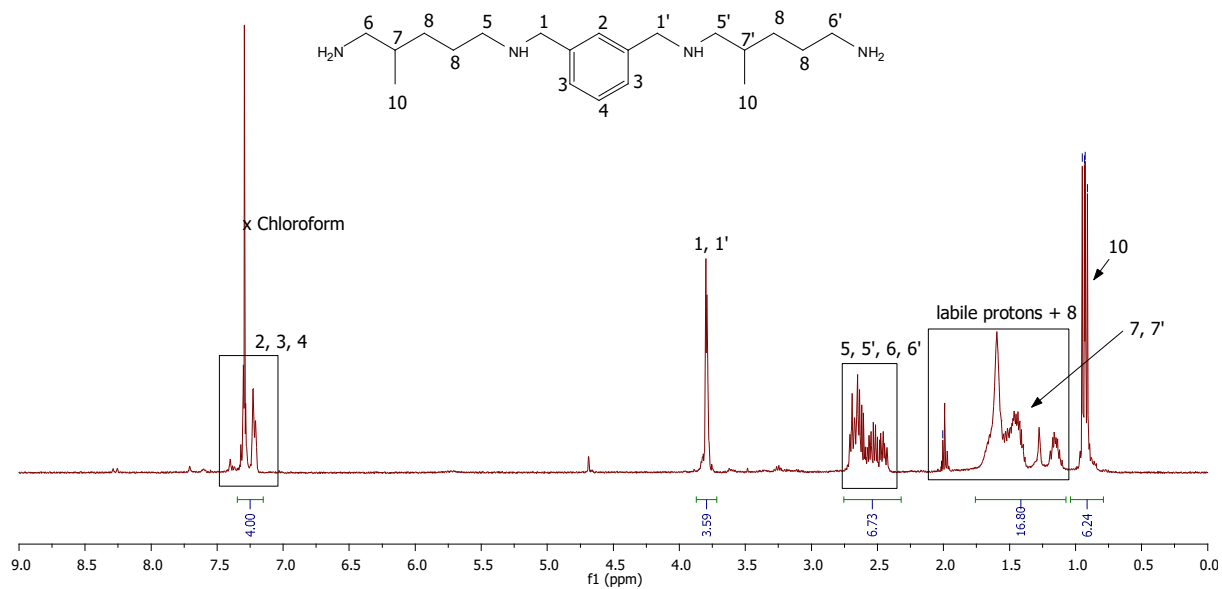
v. $^1\text{H} - ^{13}\text{C}$ HSQC NMR



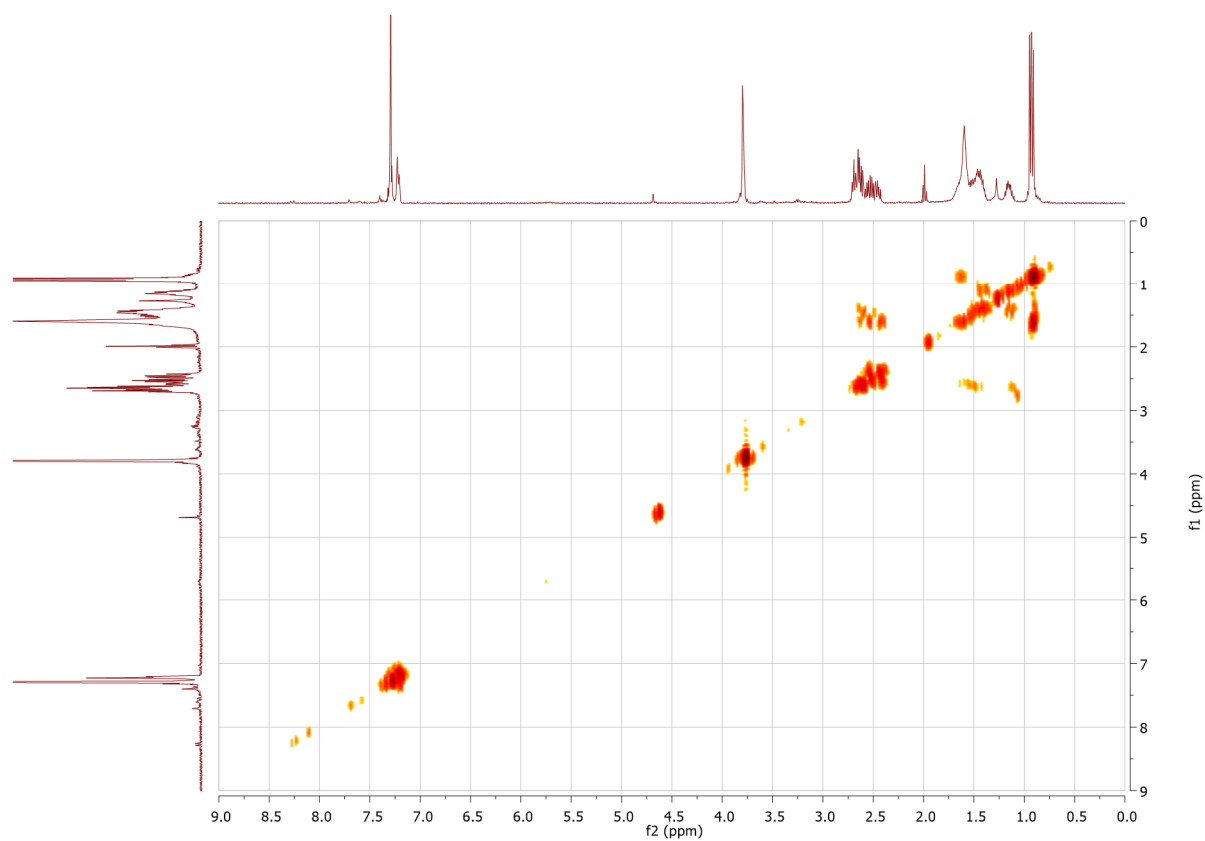
- b. Amine
i. FT-IR



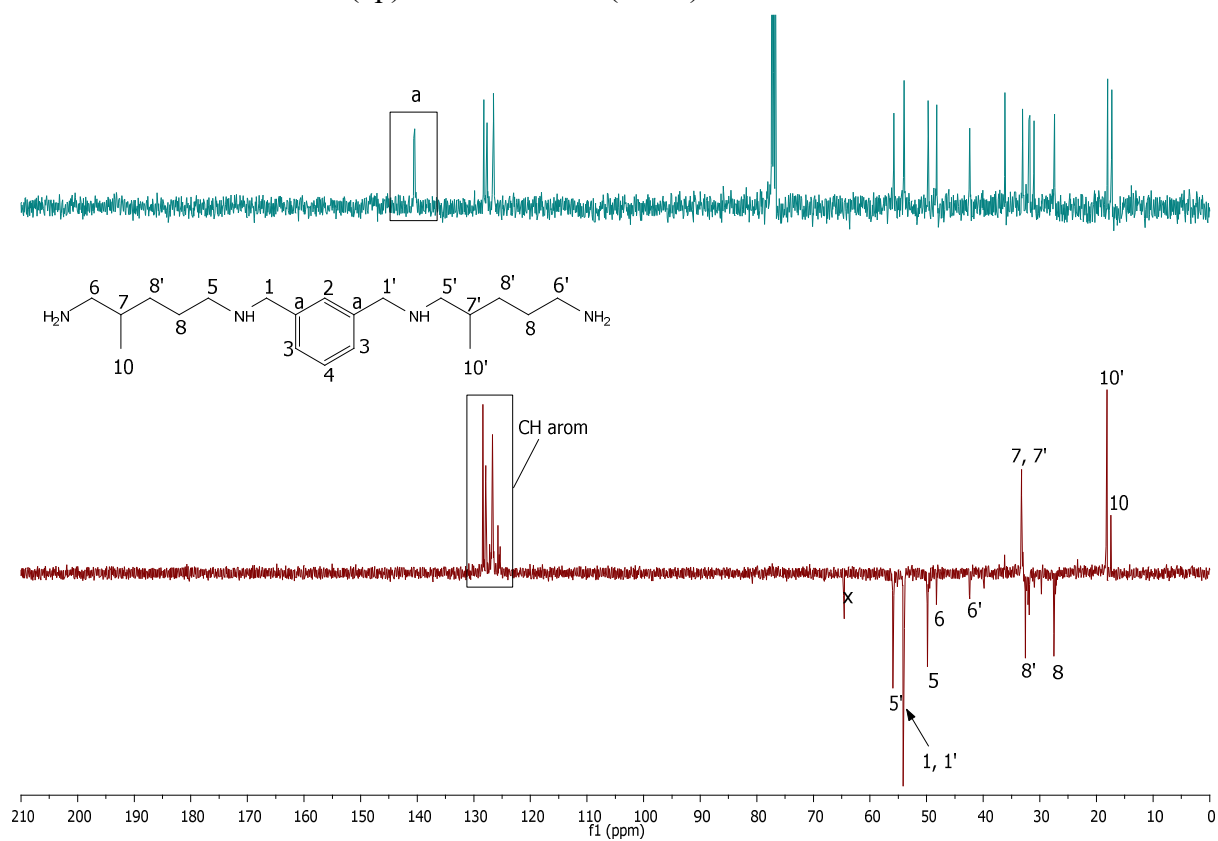
- ii. ^1H NMR



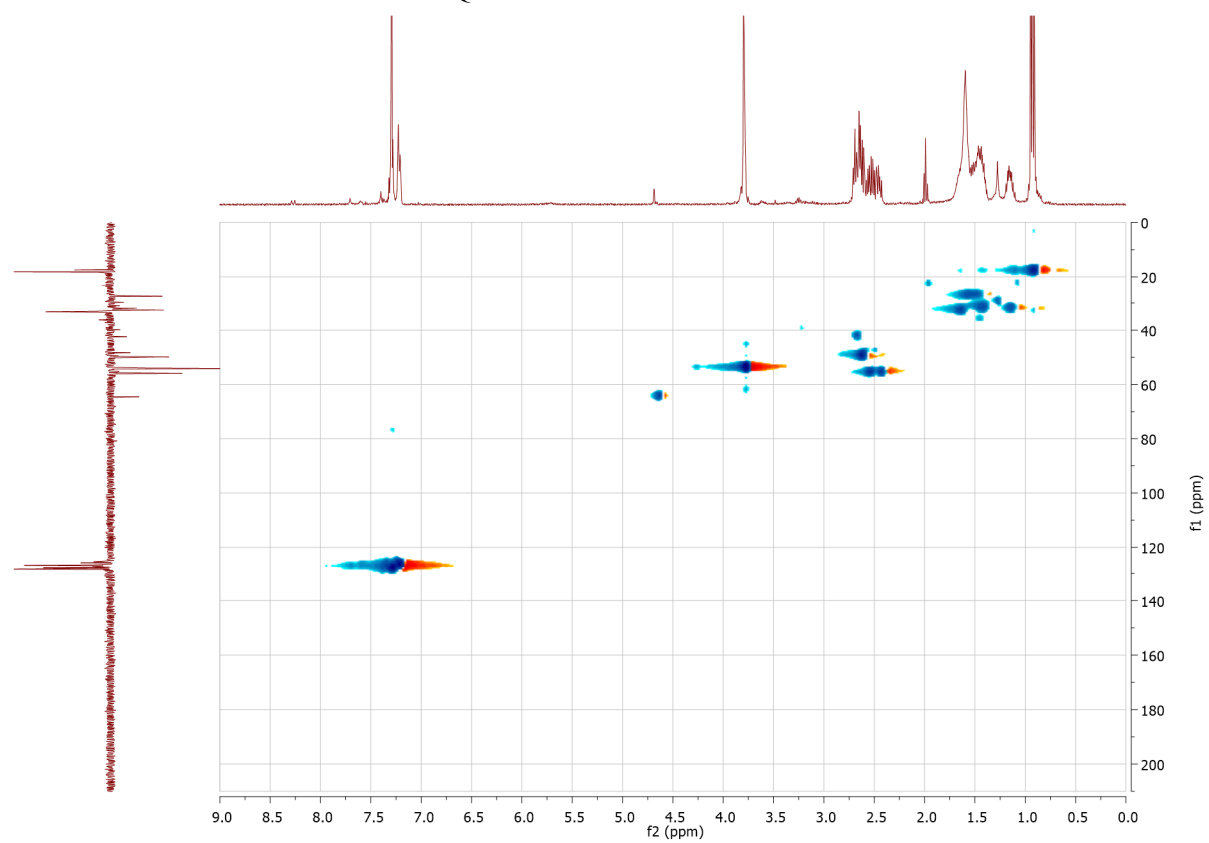
iii. $^1\text{H} - ^1\text{H}$ COSY NMR



iv. ^{13}C (up) and DEPT 135 (down) NMR



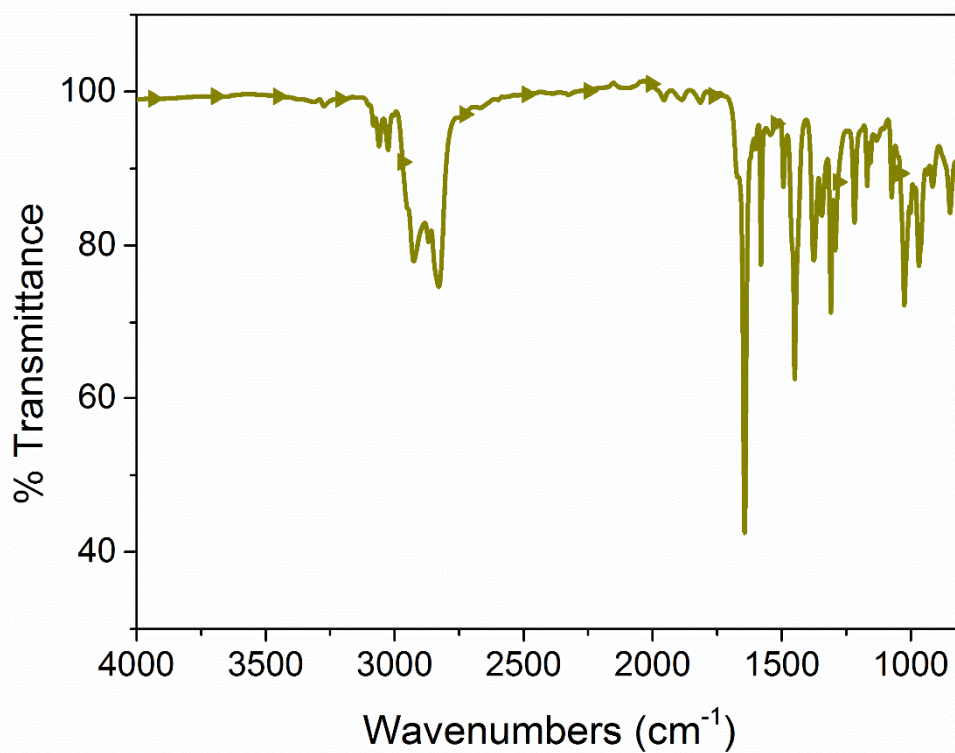
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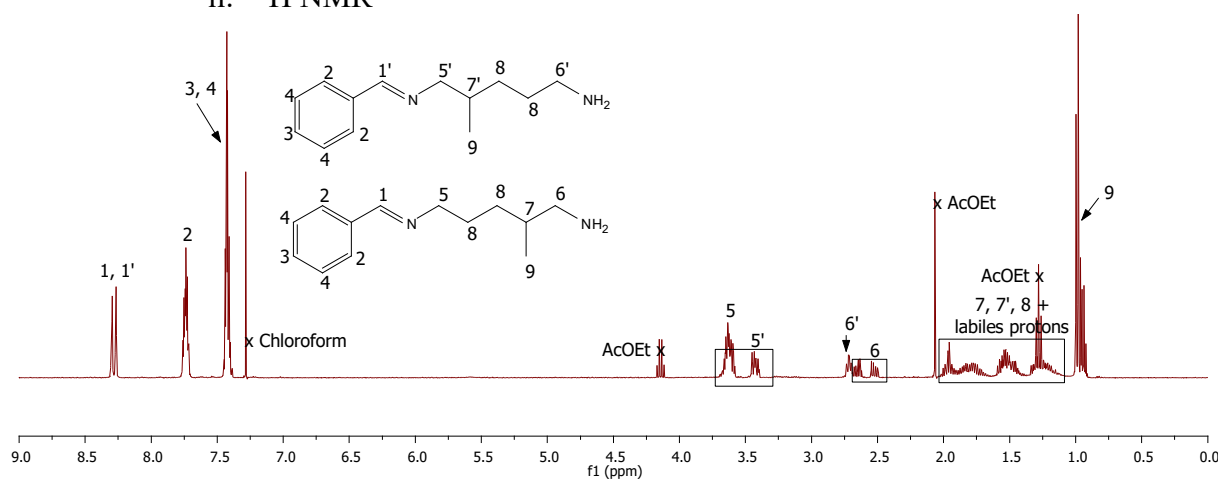
2. BDA characterizations

a. Imine

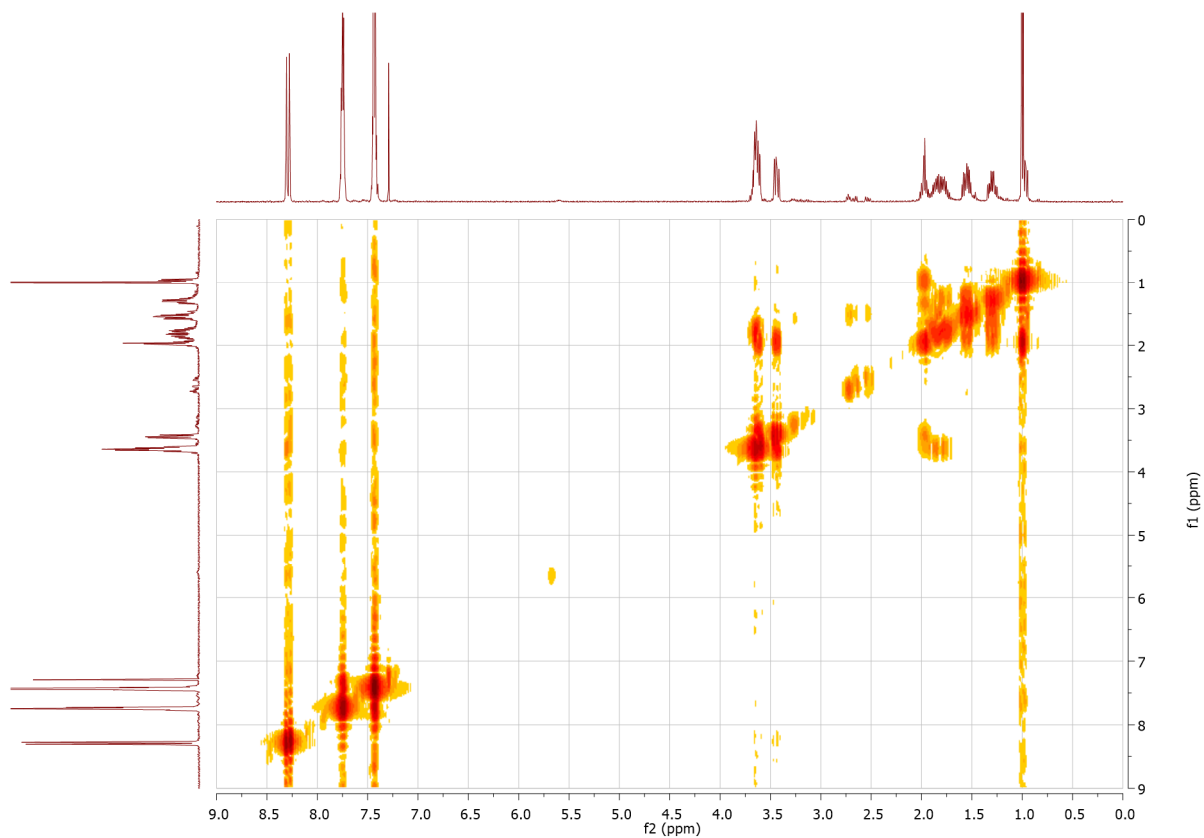
i. FT-IR



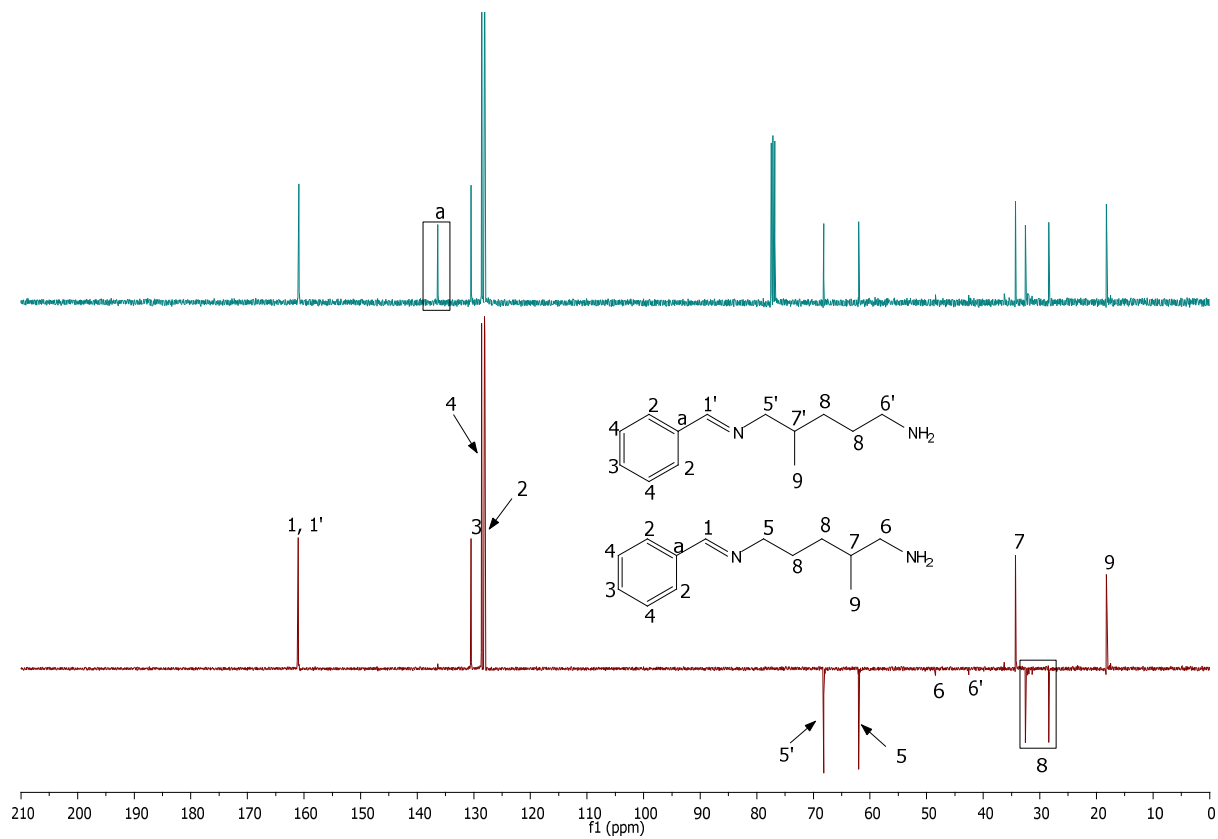
ii. ^1H NMR



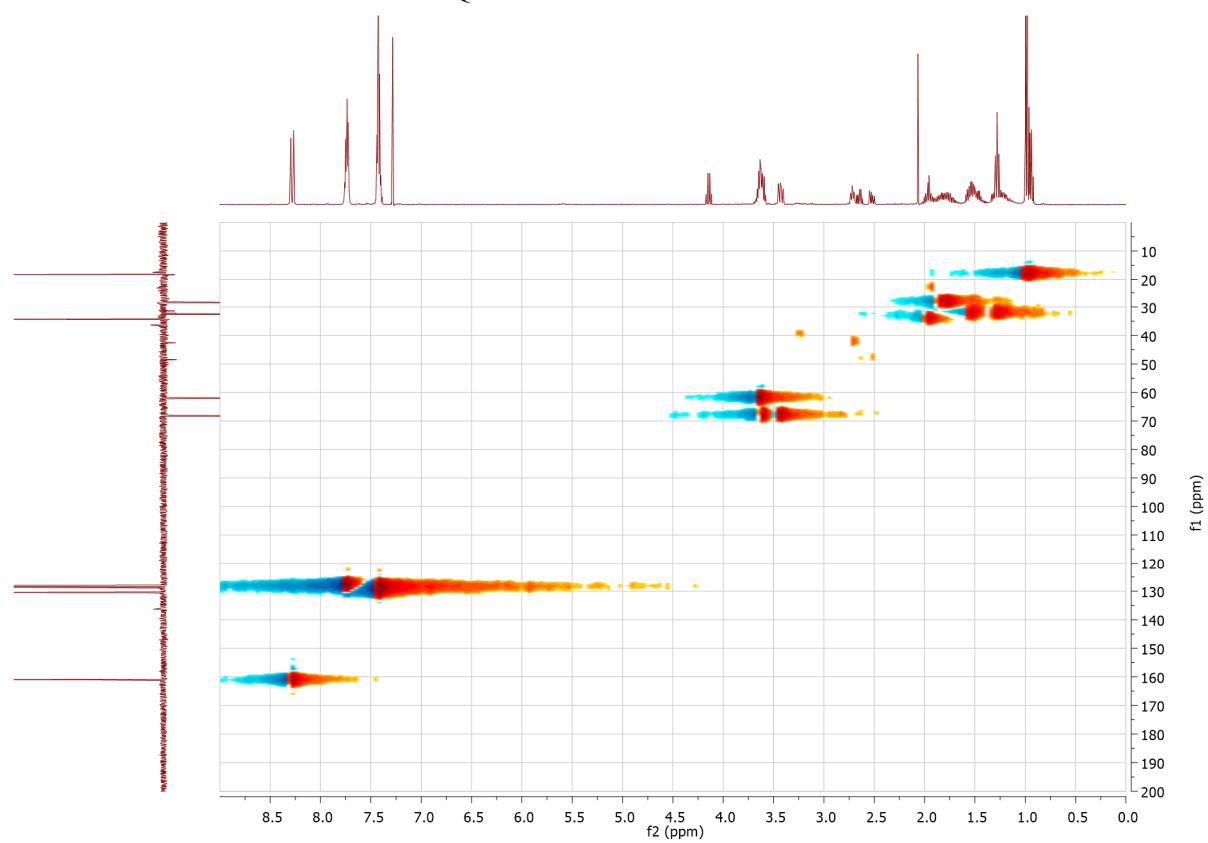
iii. $^1\text{H} - ^1\text{H}$ COSY NMR



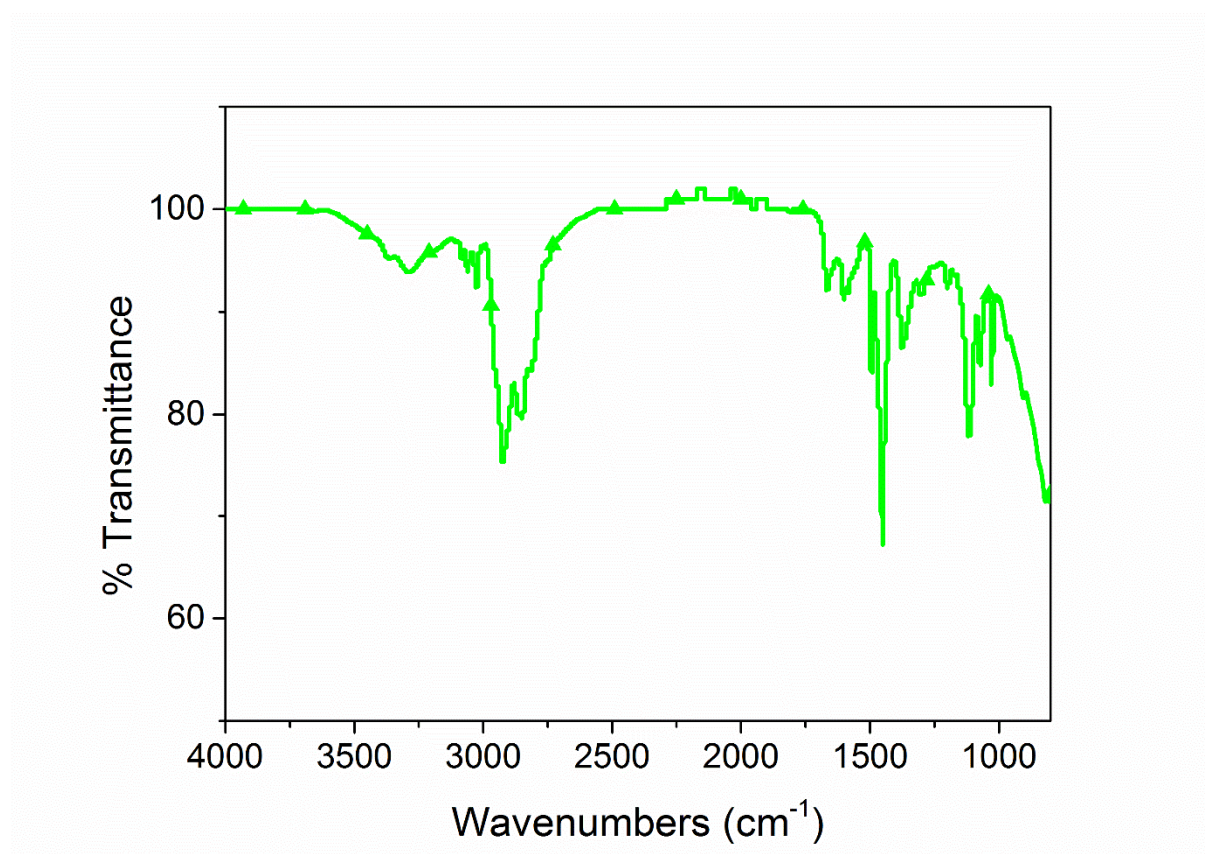
iv. ^{13}C (up) and DEPT 135 (down) NMR



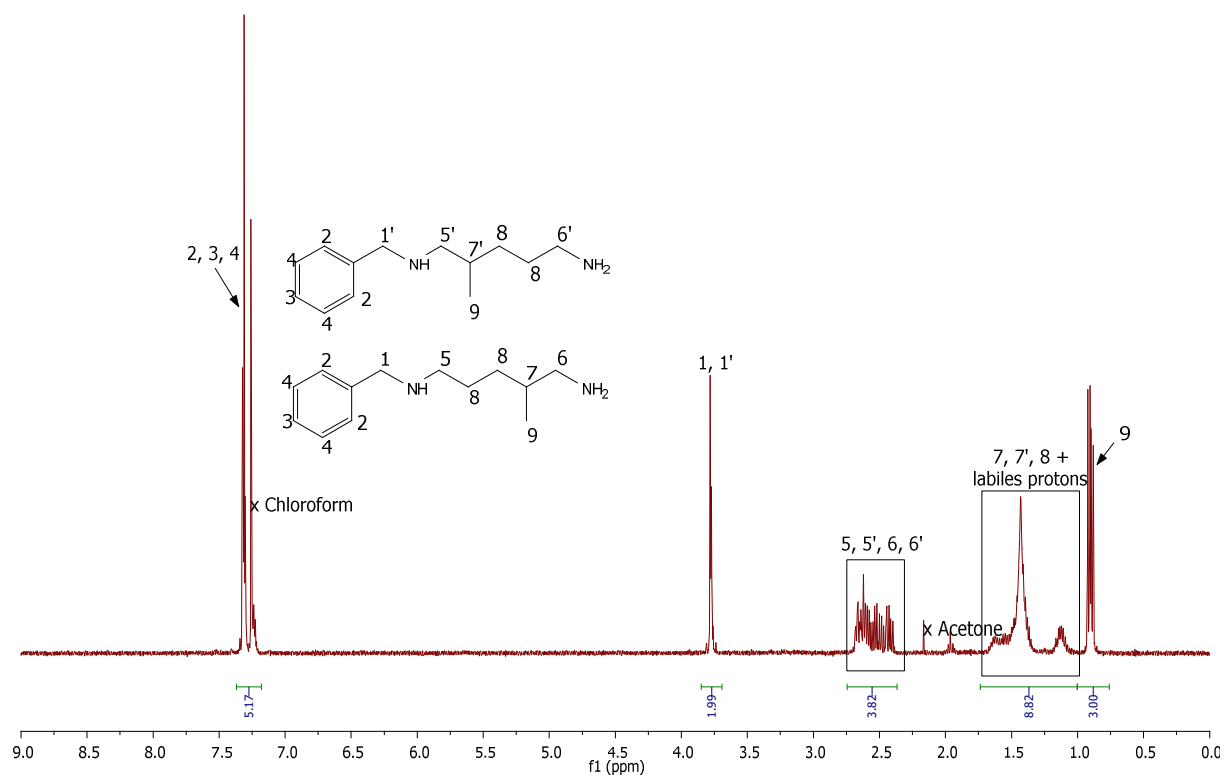
v. $^1\text{H} - ^{13}\text{C}$ HSQC NMR



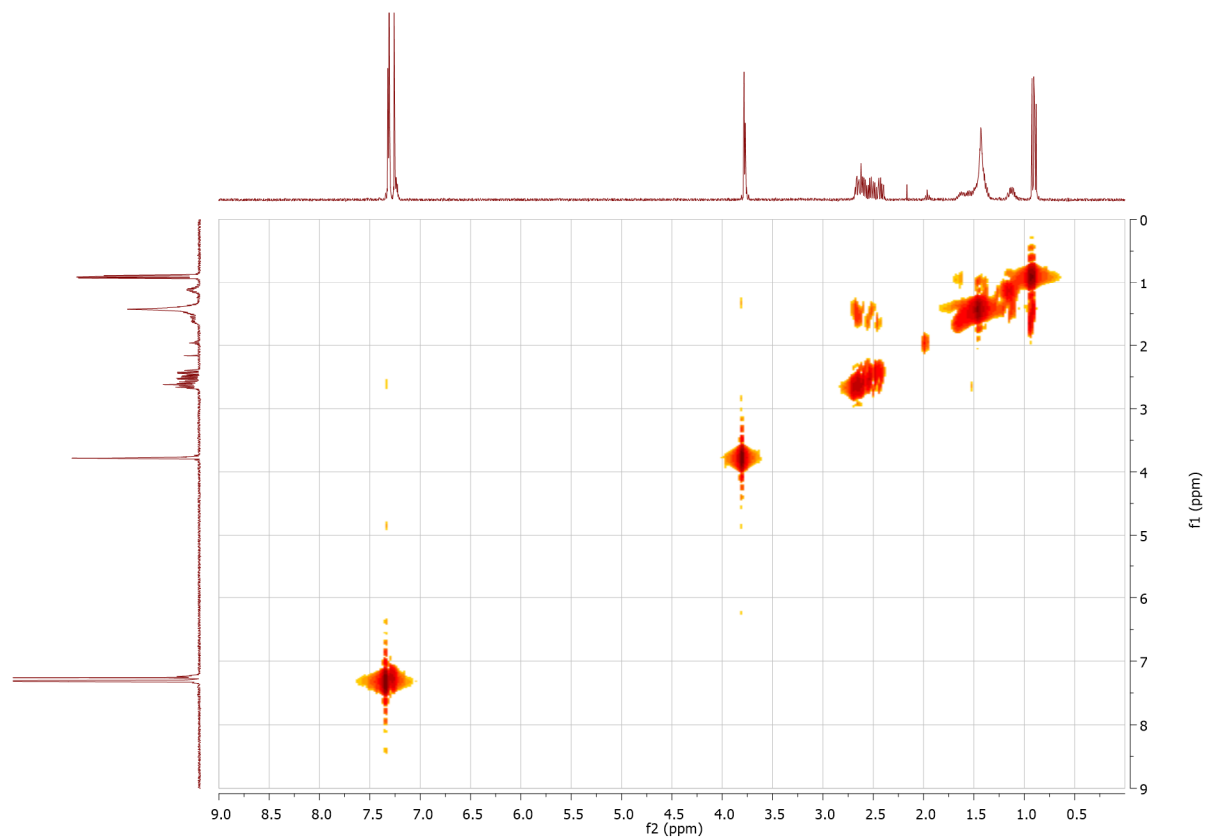
- b. Amine
i. FT-IR



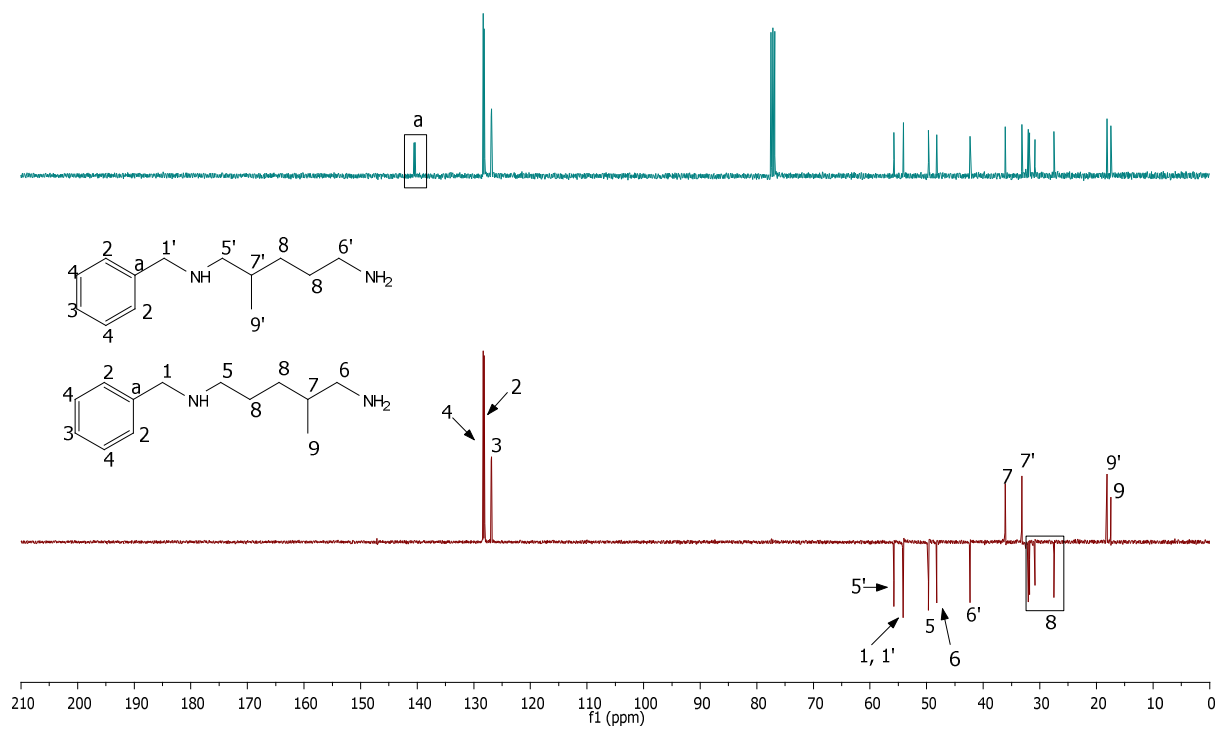
- ii. ¹H NMR



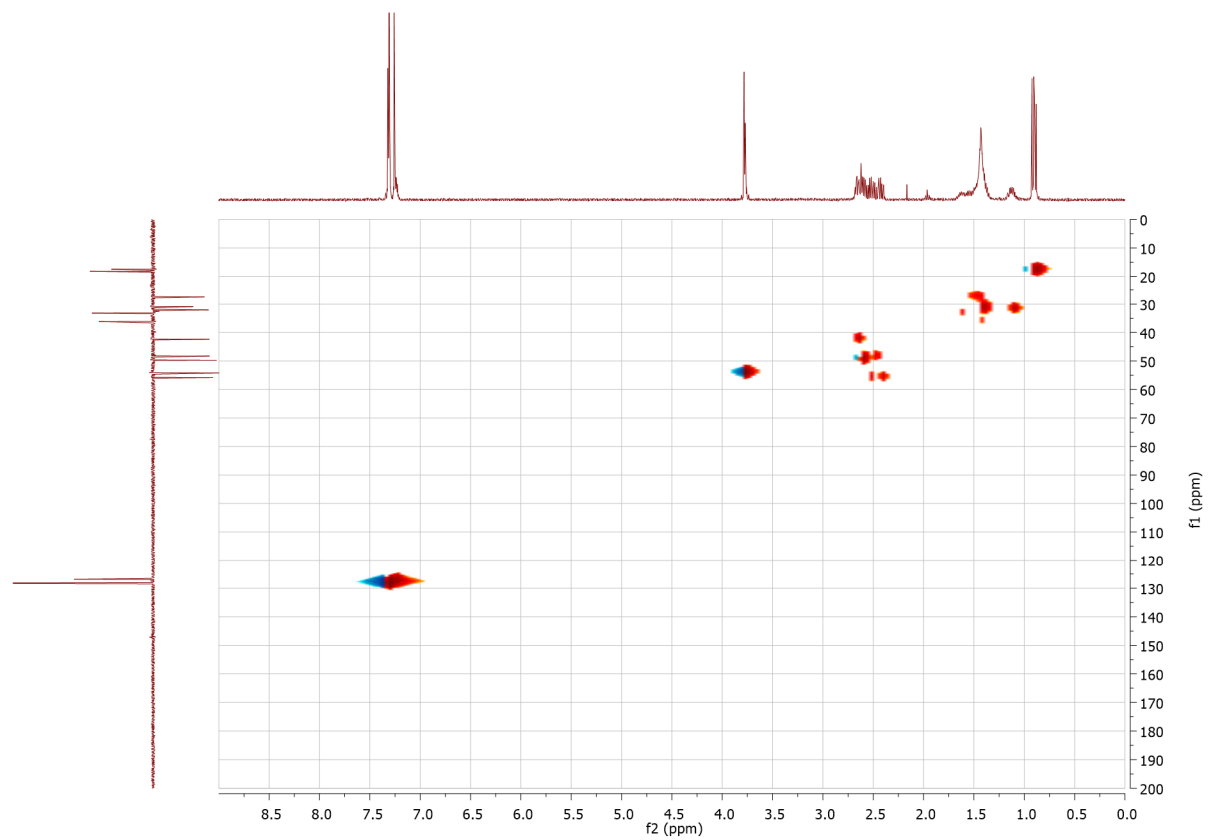
iii. $^1\text{H} - ^1\text{H}$ COSY NMR



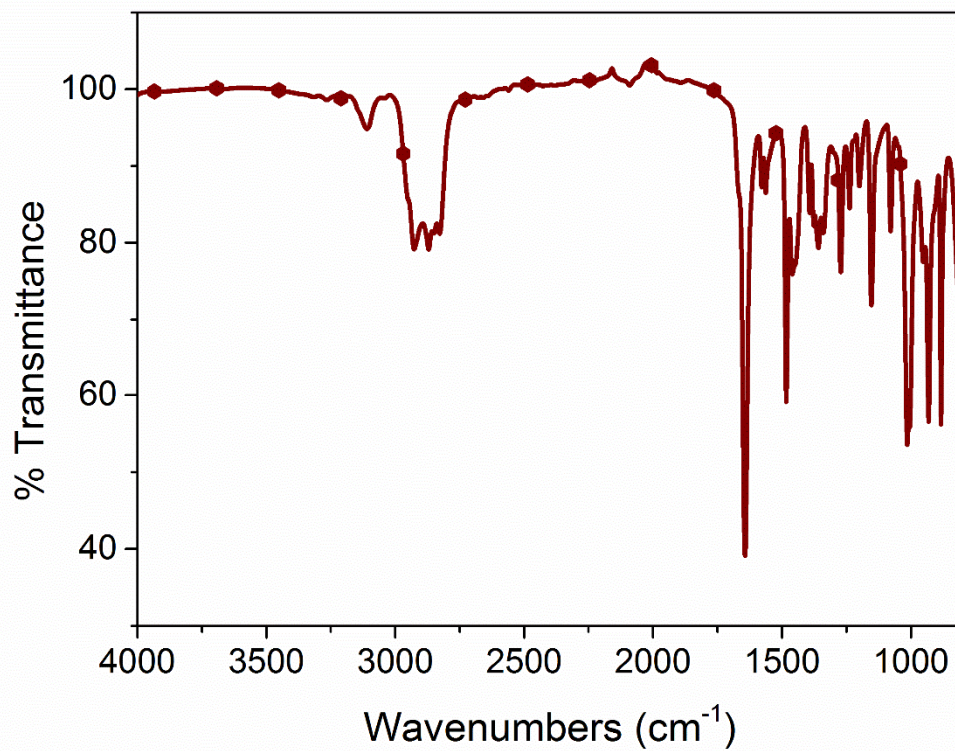
iv. ^{13}C (up) and DEPT 135 (down) NMR



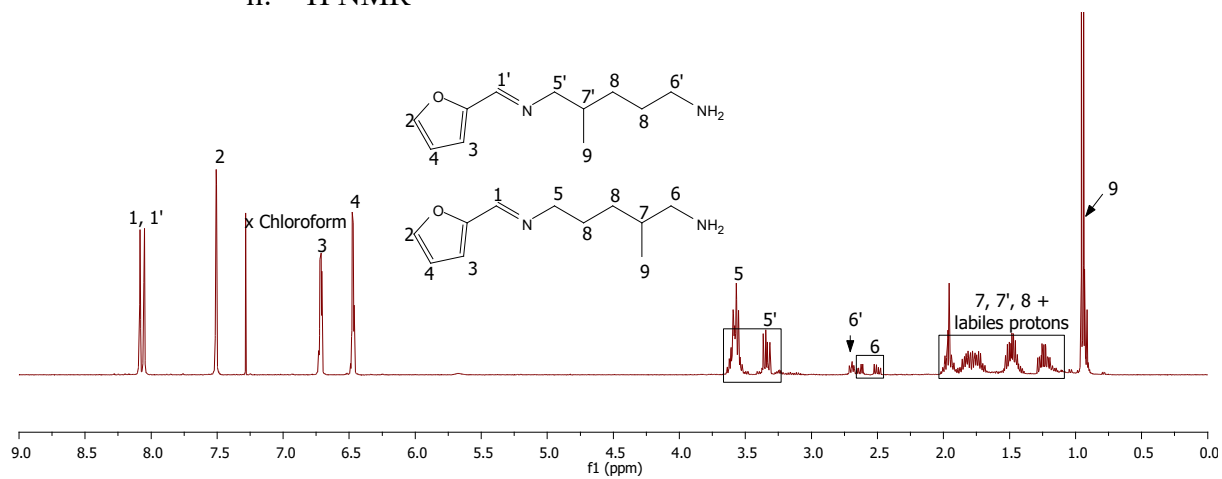
v. $^1\text{H} - ^{13}\text{C}$ HSQC NMR



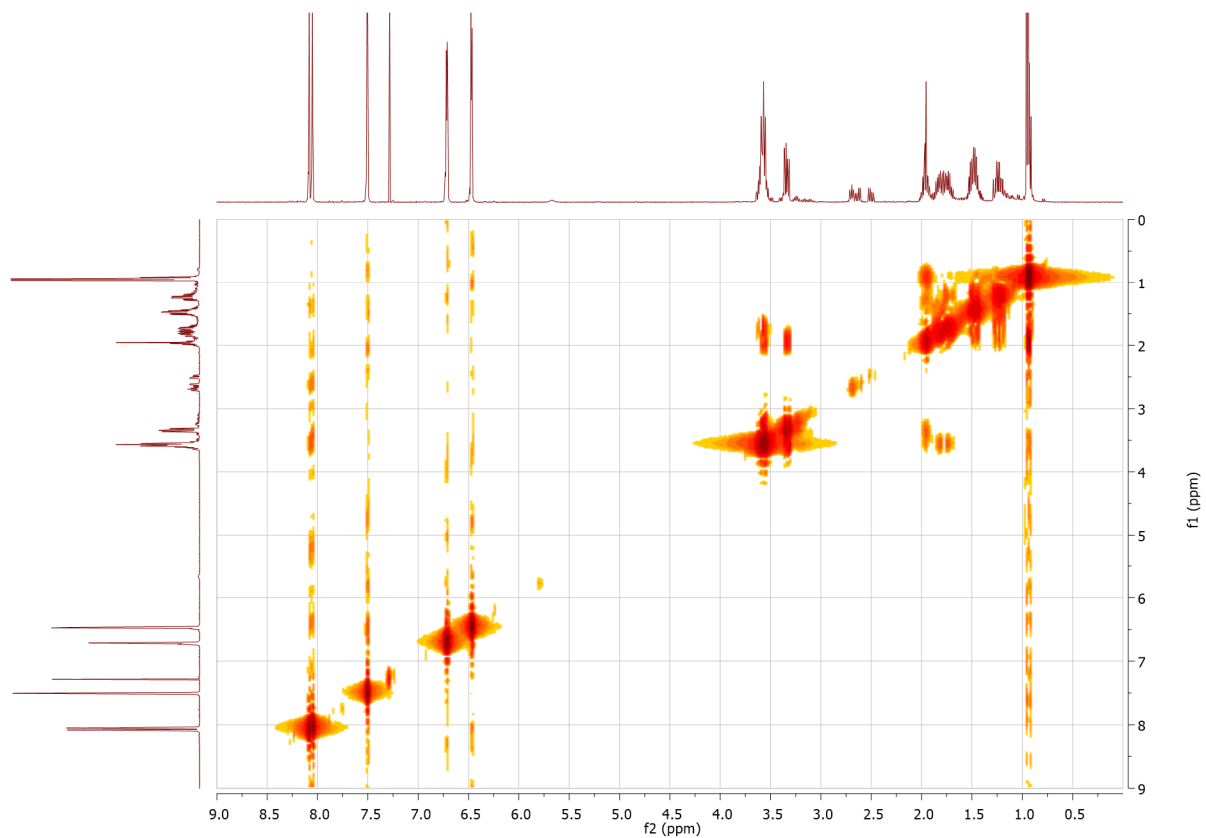
3. FDA characterizations
 - a. Imine
 - i. FT-IR



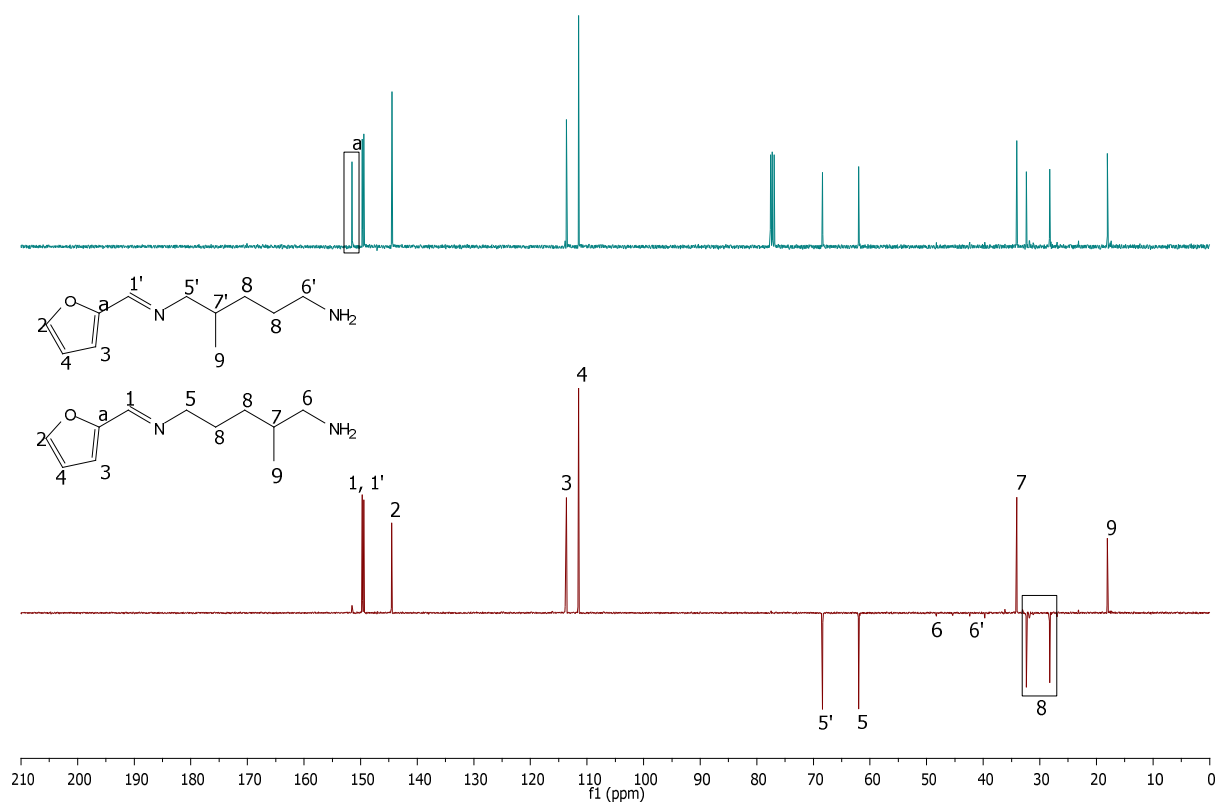
- ii. ^1H NMR



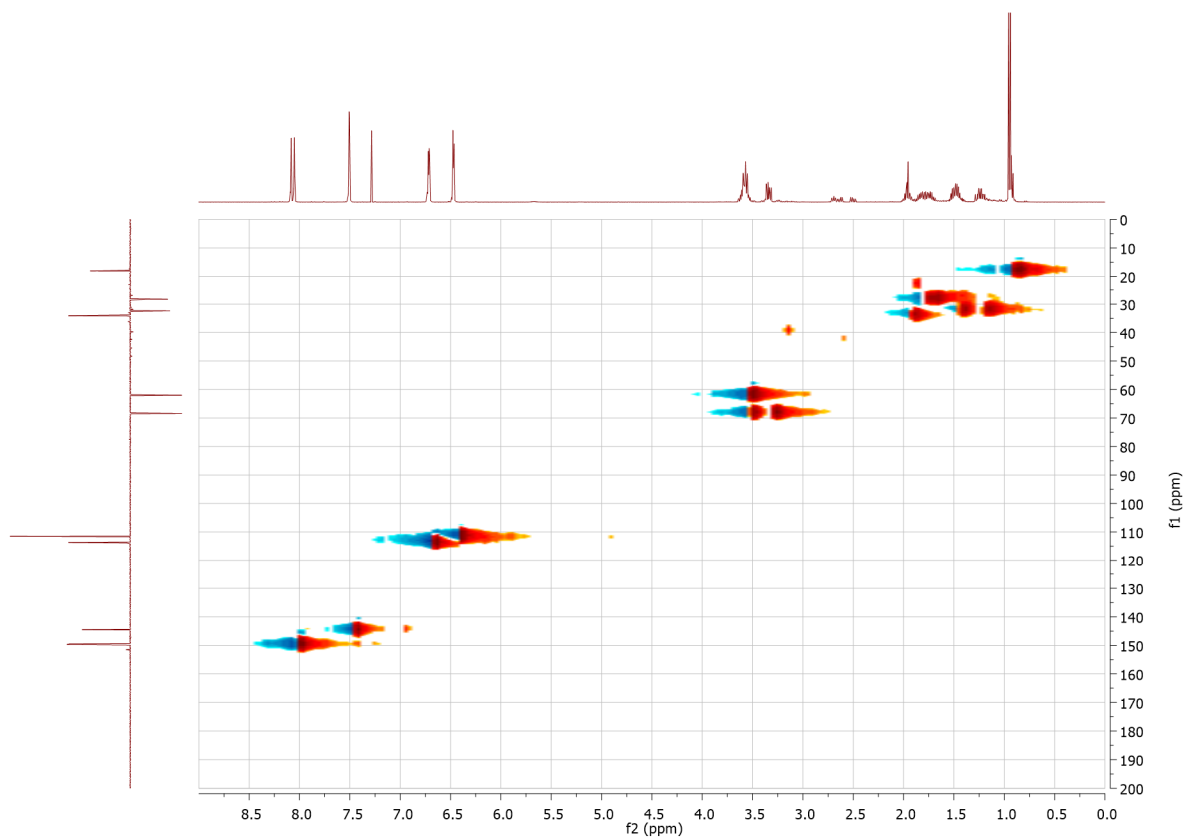
iii. $^1\text{H} - ^1\text{H}$ COSY NMR



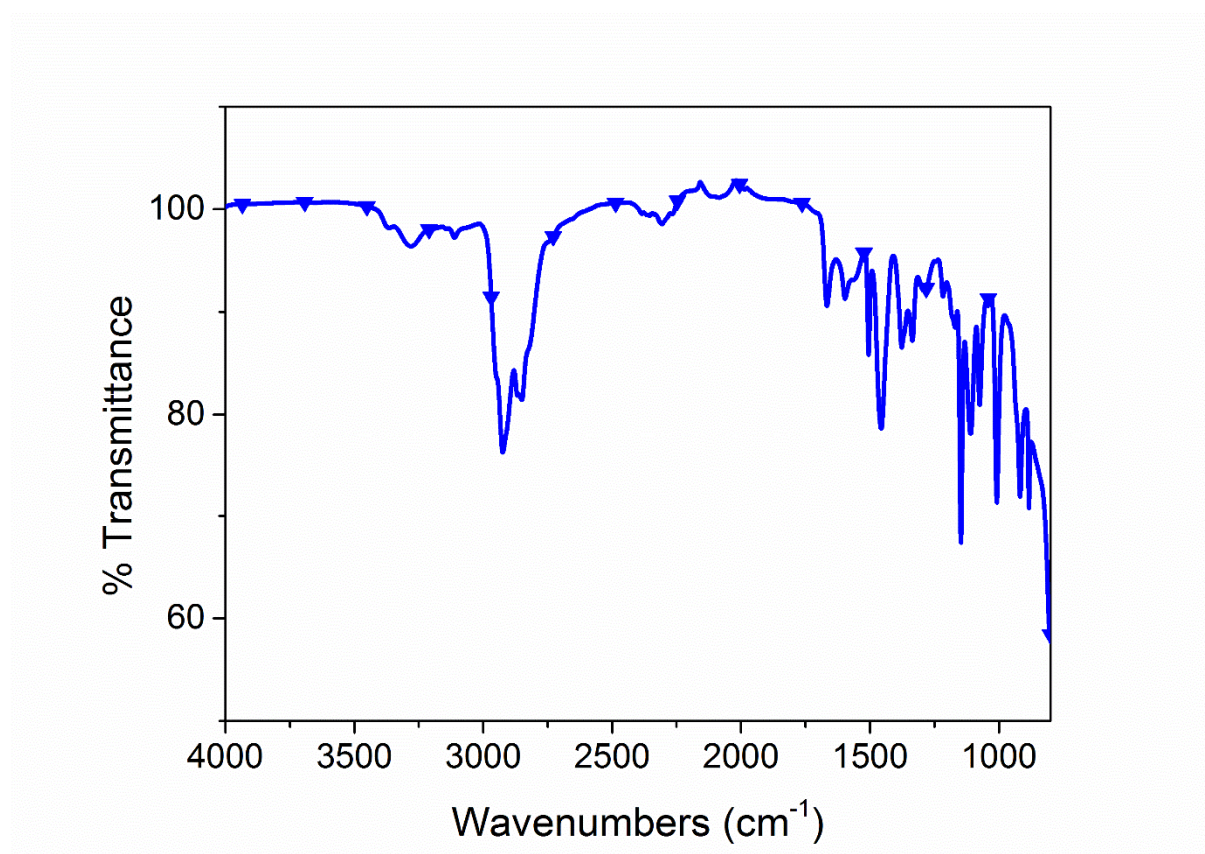
iv. ^{13}C (up) and DEPT 135 (down) NMR



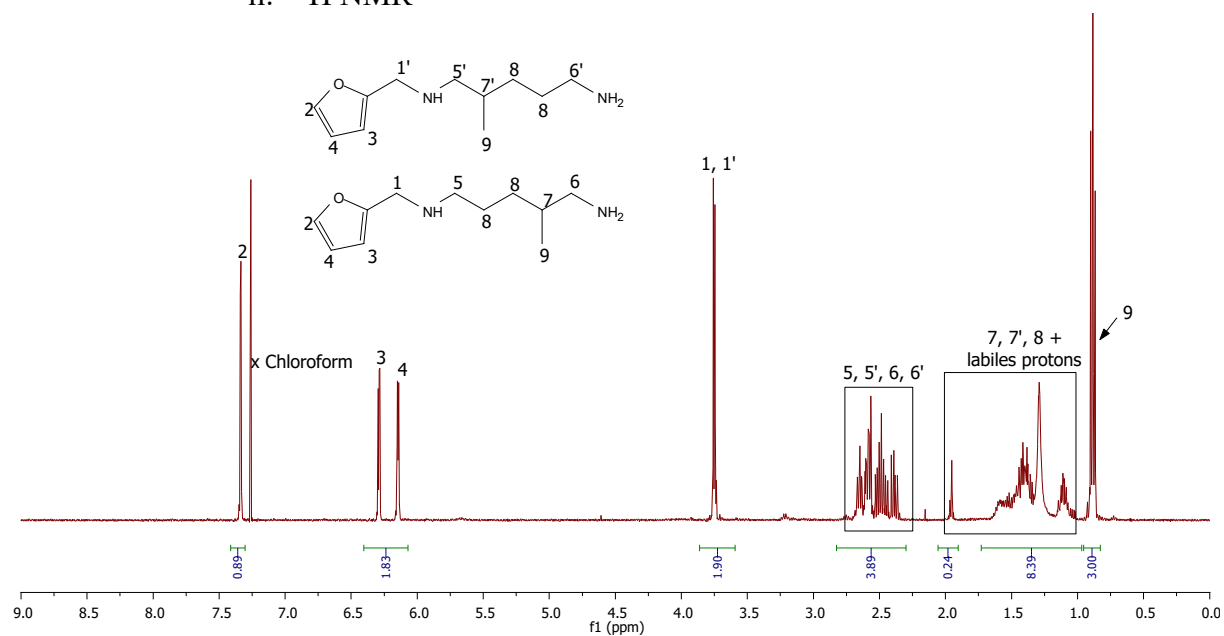
v. $^1\text{H} - ^{13}\text{C}$ HSQC NMR



- b. Amine
i. FT-IR



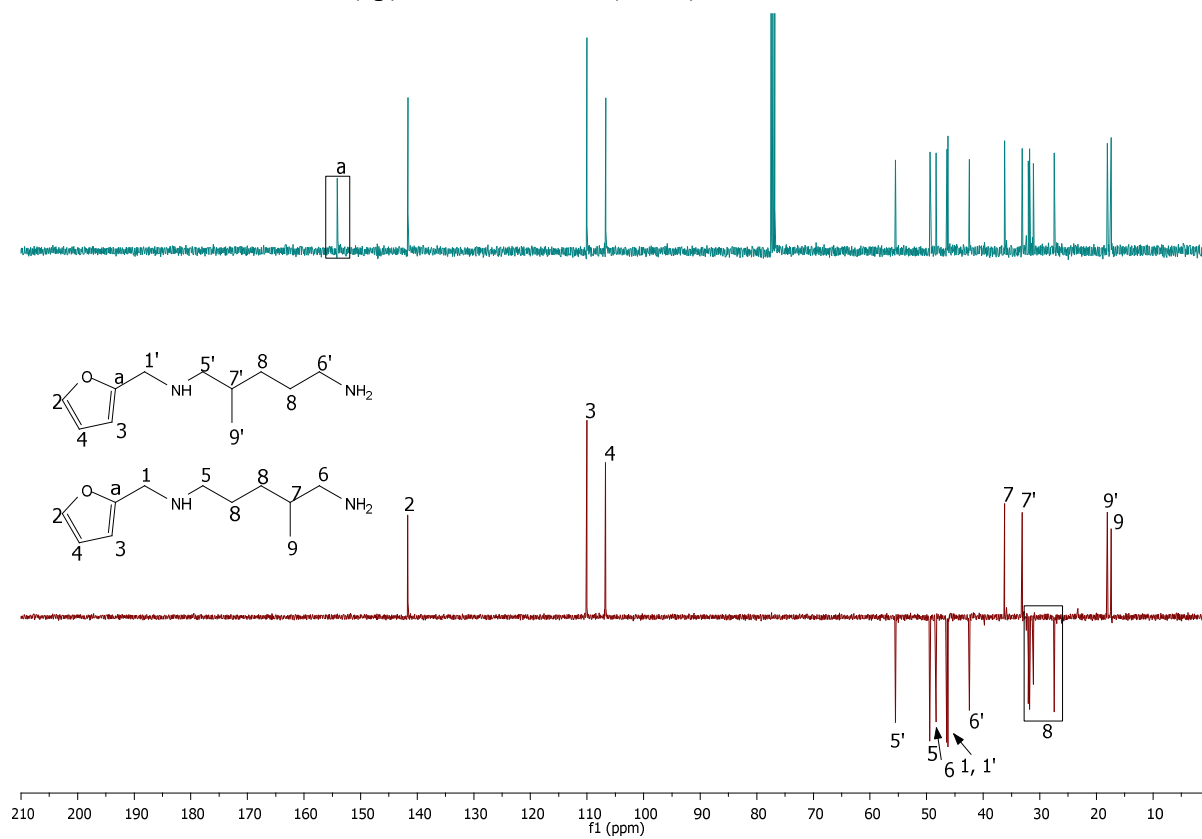
- ii. ^1H NMR



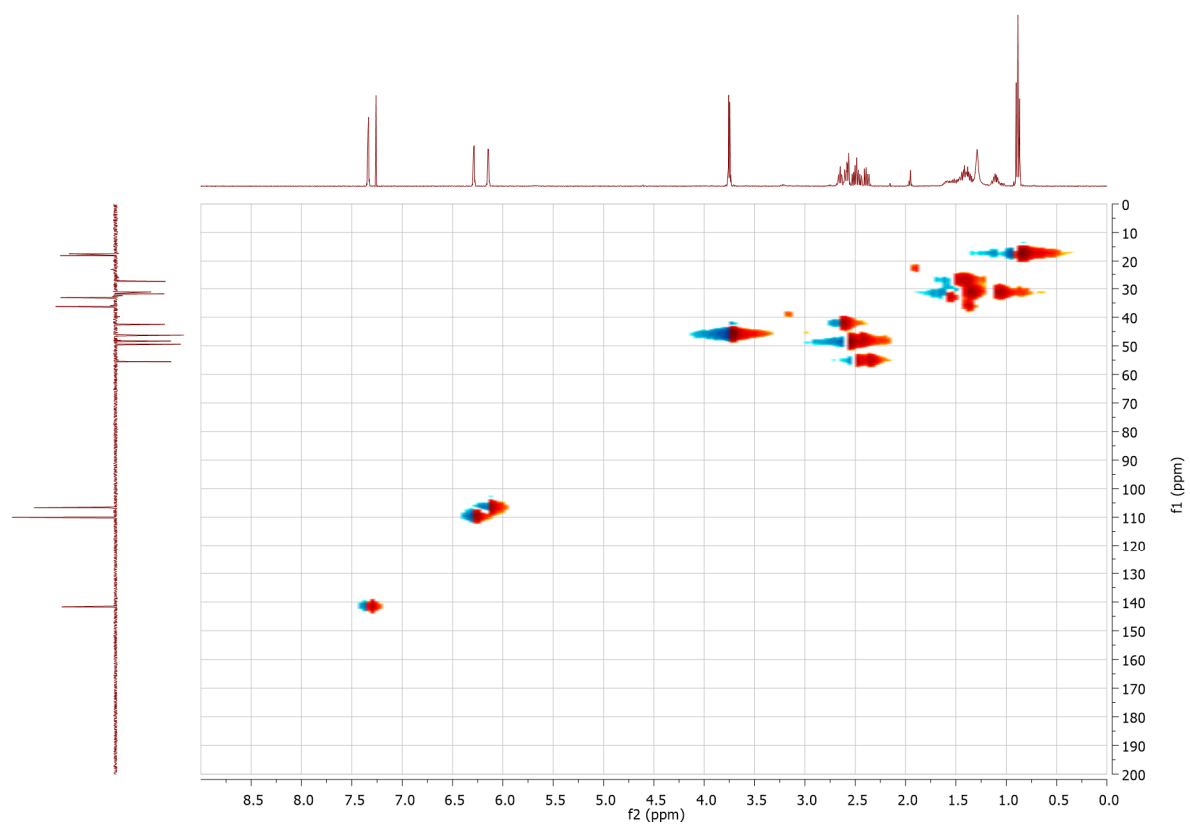
iii. $^1\text{H} - ^1\text{H}$ COSY NMR



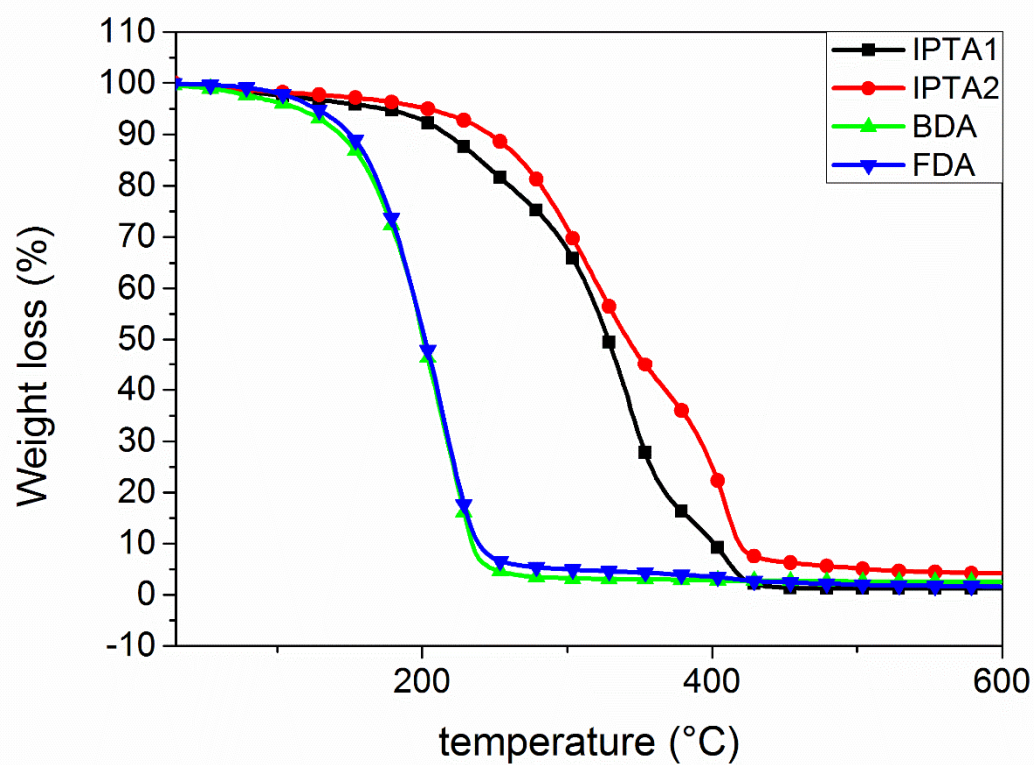
iv. ^{13}C (up) and DEPT 135 (down) NMR



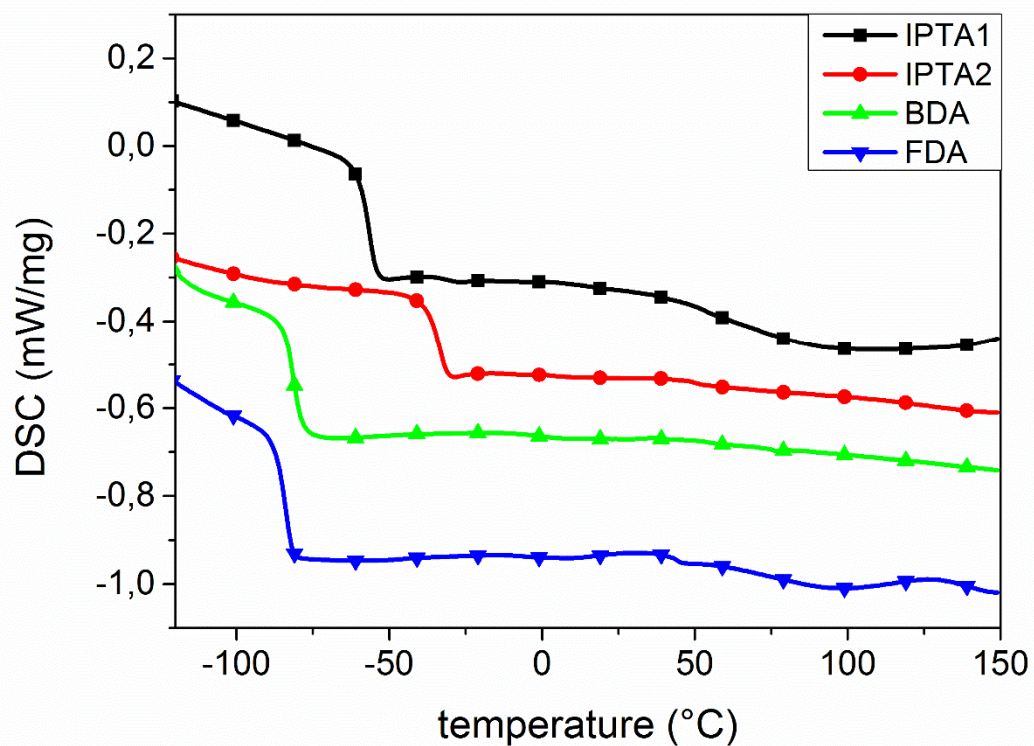
v. $^1\text{H} - ^{13}\text{C}$ HSQC NMR



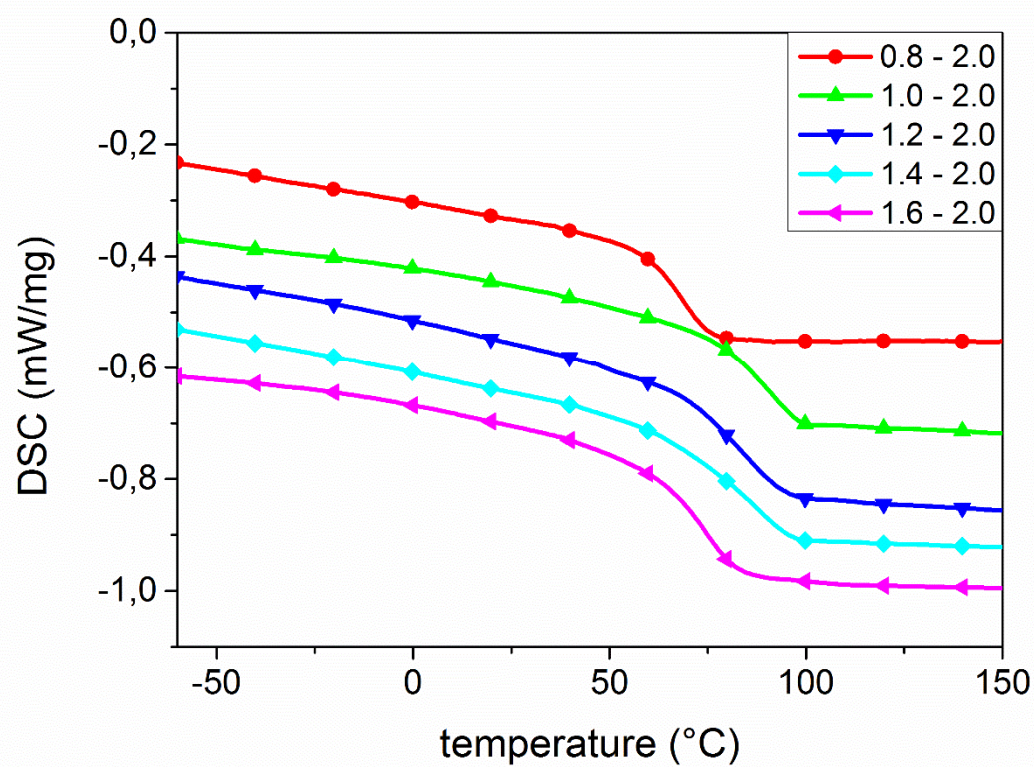
4. TGA measurements of each synthesized amines (under nitrogen, at 20 K.min⁻¹)



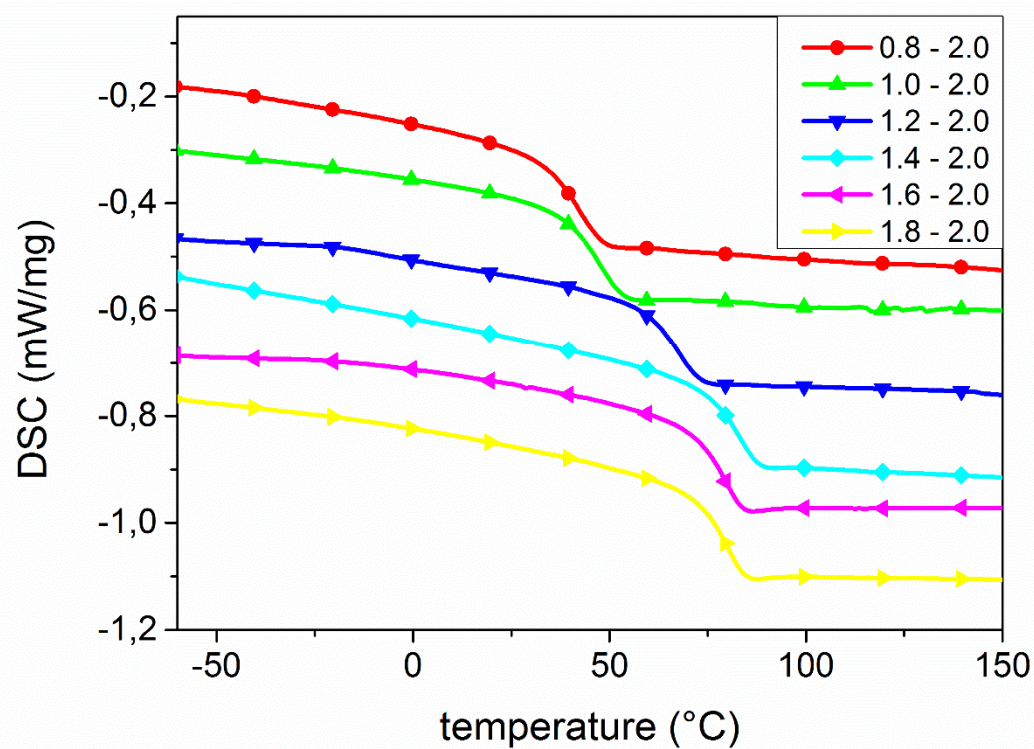
5. DSC measurements of each synthesized amines (under nitrogen, at 20 K.min⁻¹)



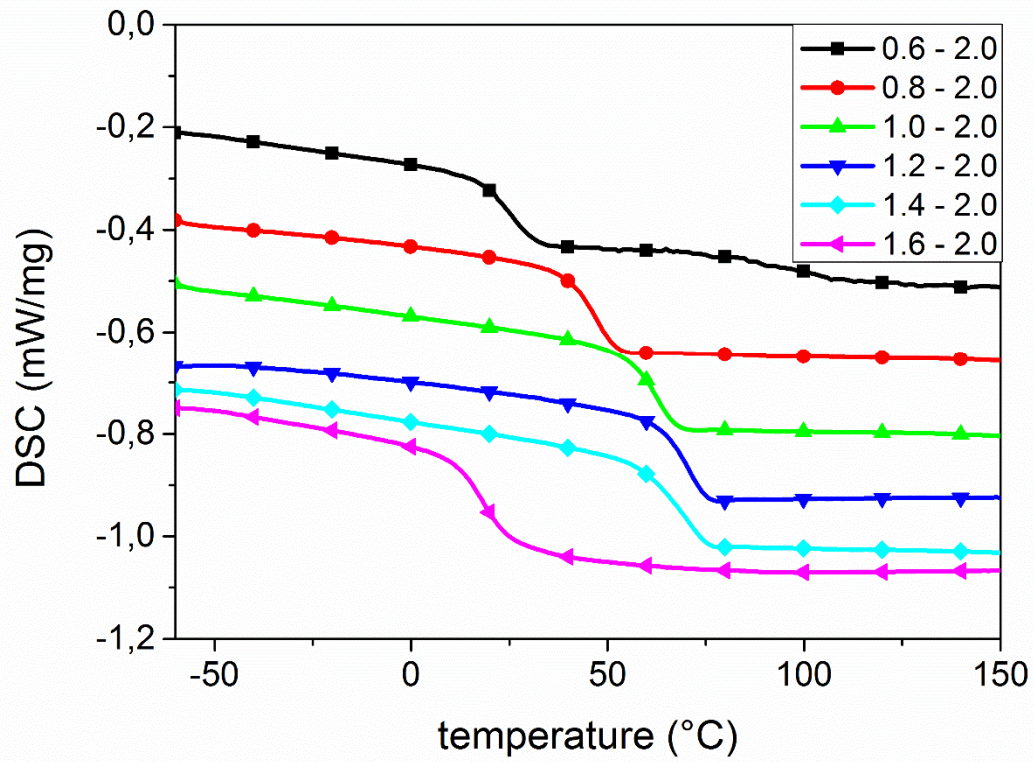
6. Determination of optimal ratio for DGEBA-based thermosets
a. From IPTA1 and DGEBA



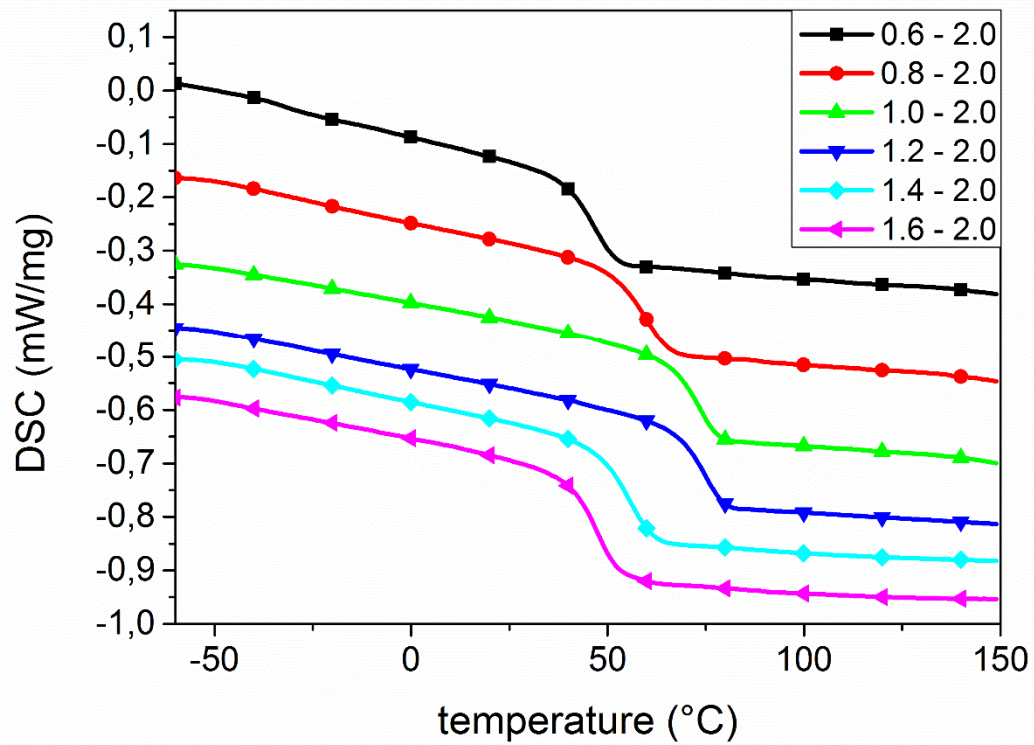
b. From IPT2 and DGEBA



c. From BDA and DGEBA

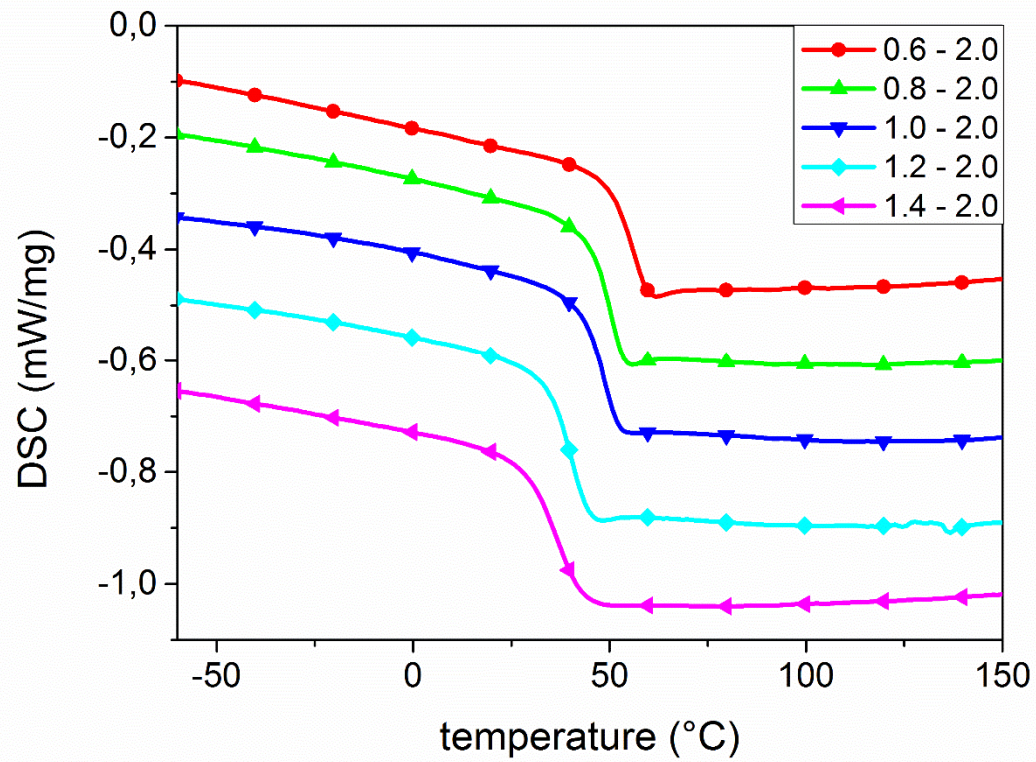


d. From FDA and DGEBA

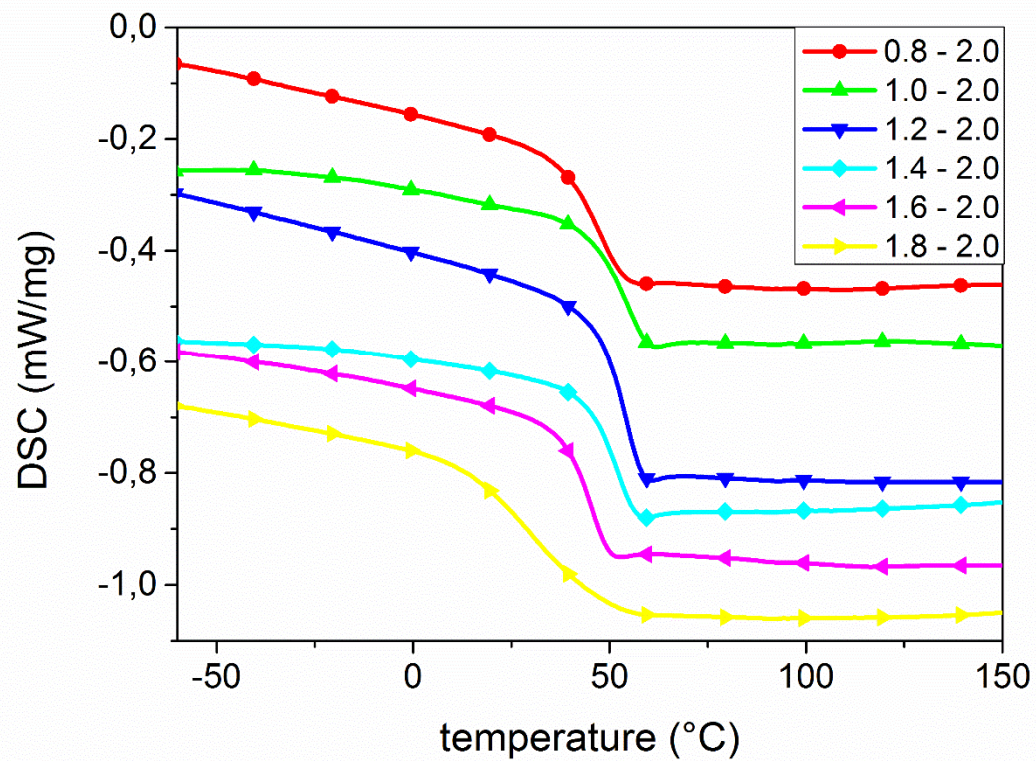


7. Determination of optimal ratio DGEVA-based thermosets

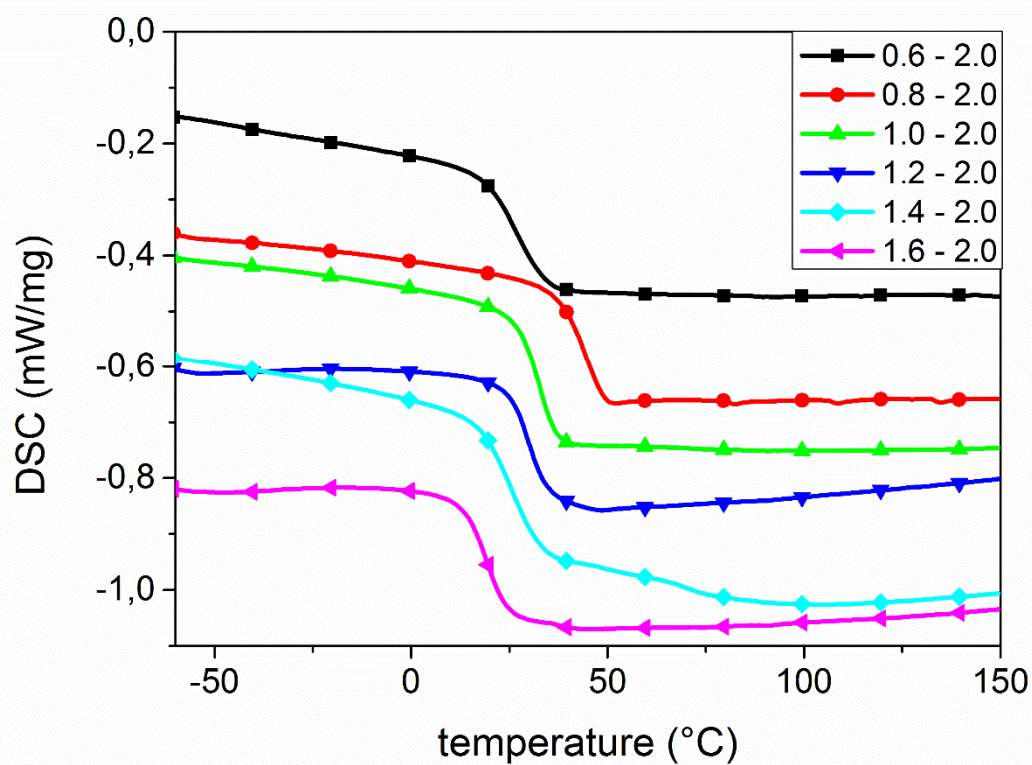
a. From IPTA1 and DGEVA



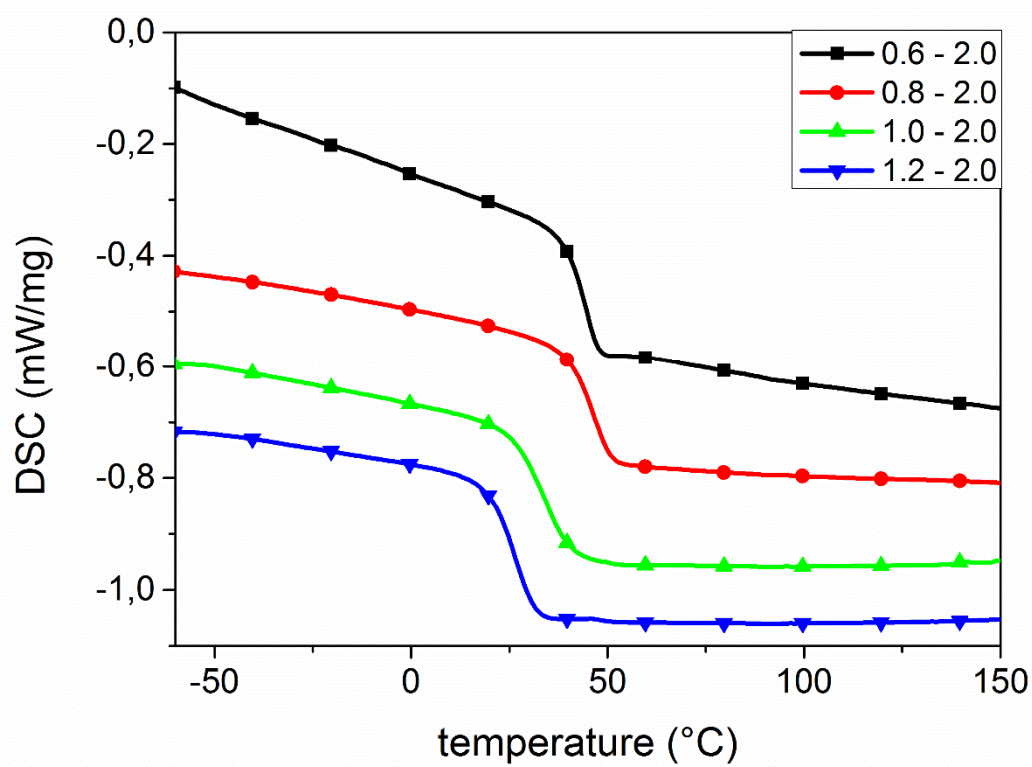
b. From IPTA2 and DGEVA



c. From BDA and DGEVA

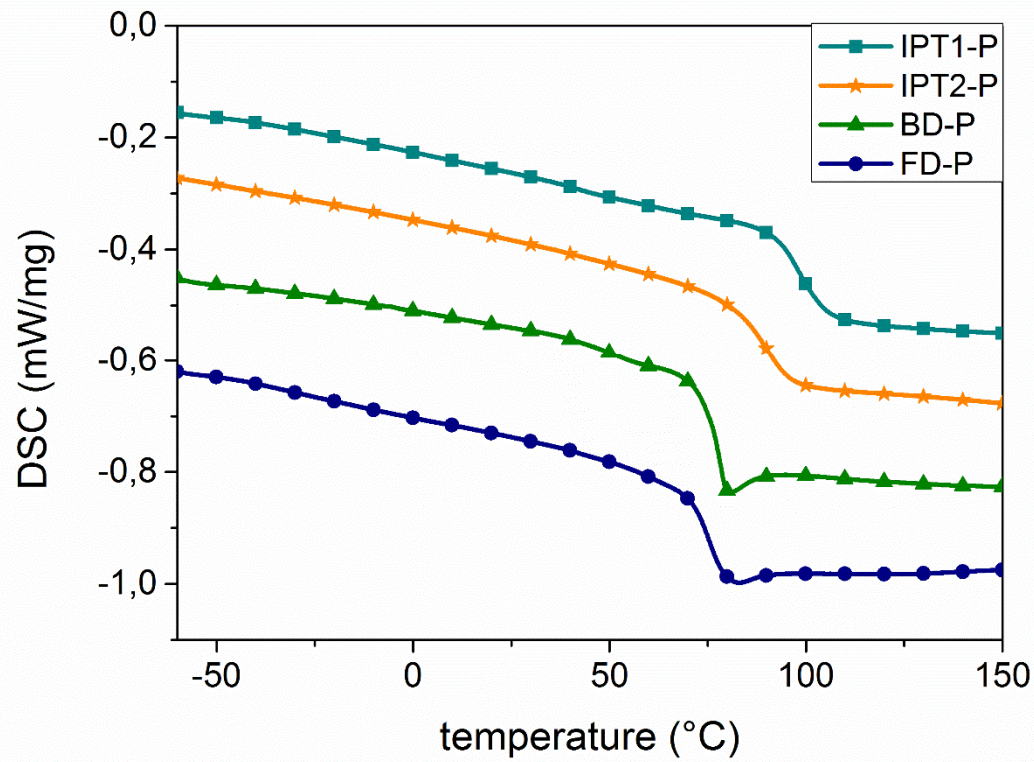


d. From FDA and DGEVA

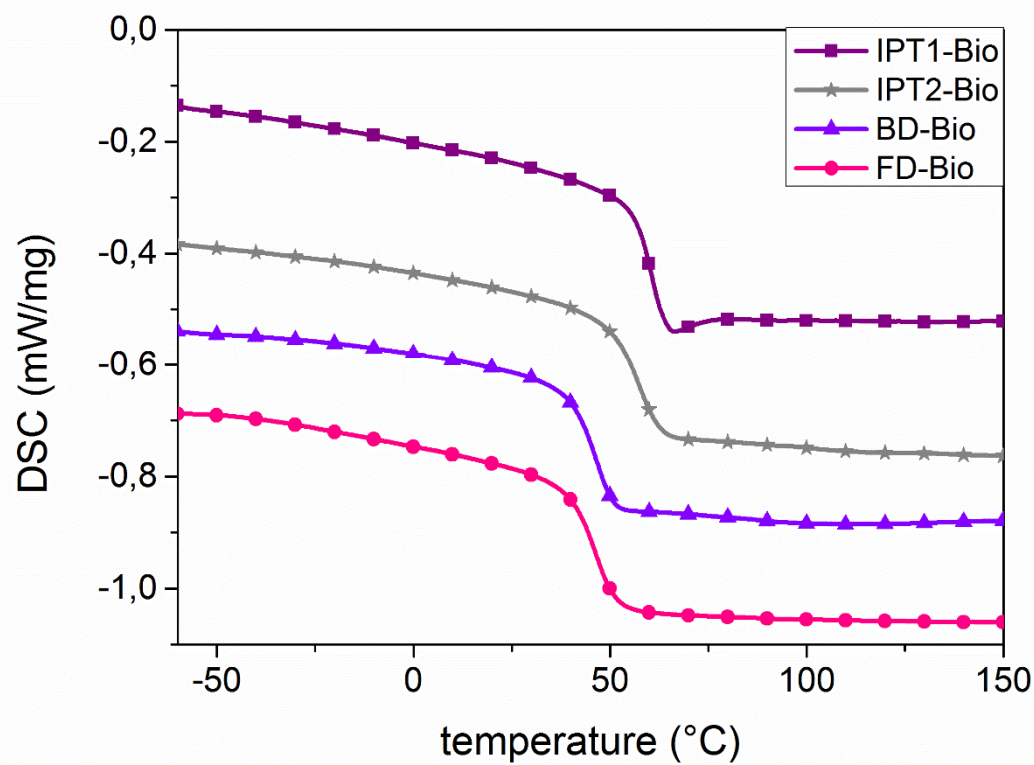


8. Characterizations of each bulk materials synthesized with optimal ratio

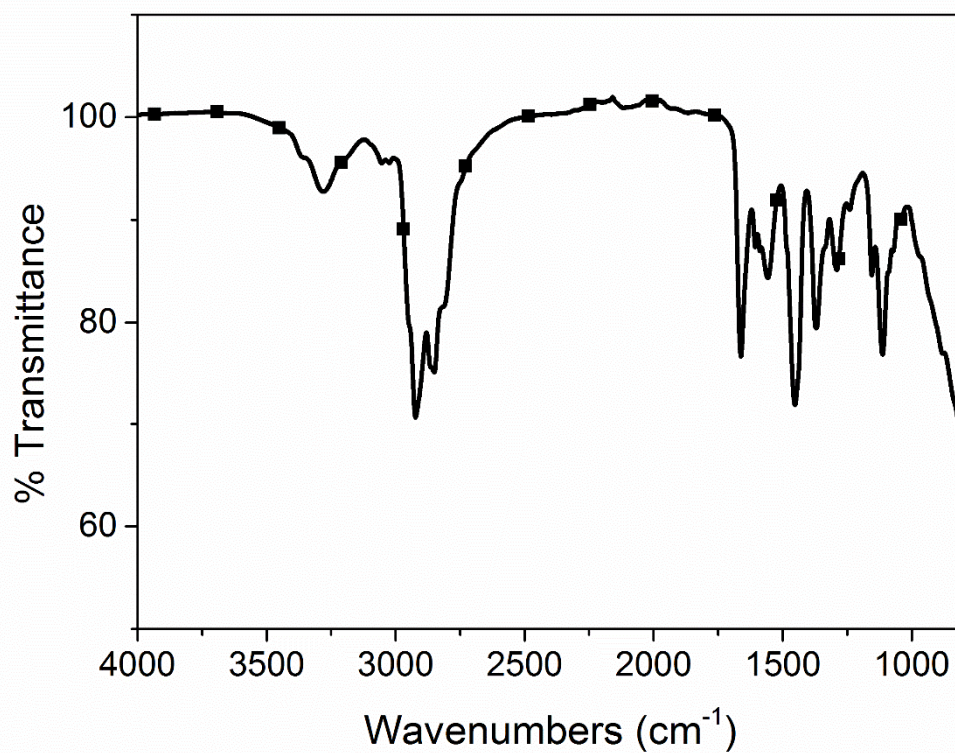
a. DSC of partially bio-based thermosets



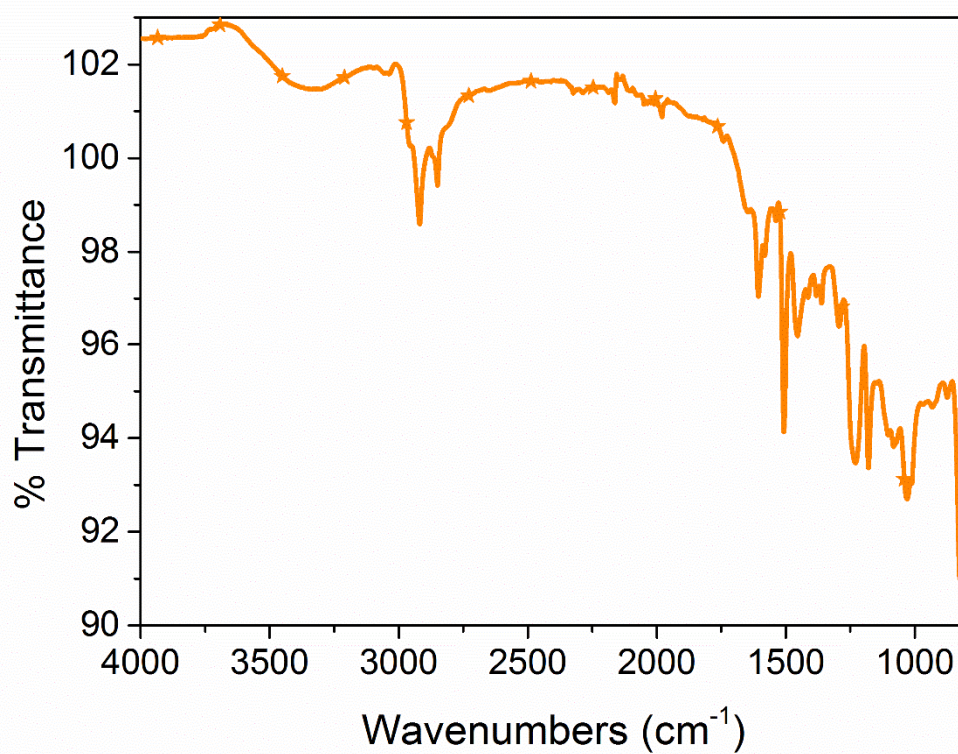
b. DSC of fully bio-based thermosets



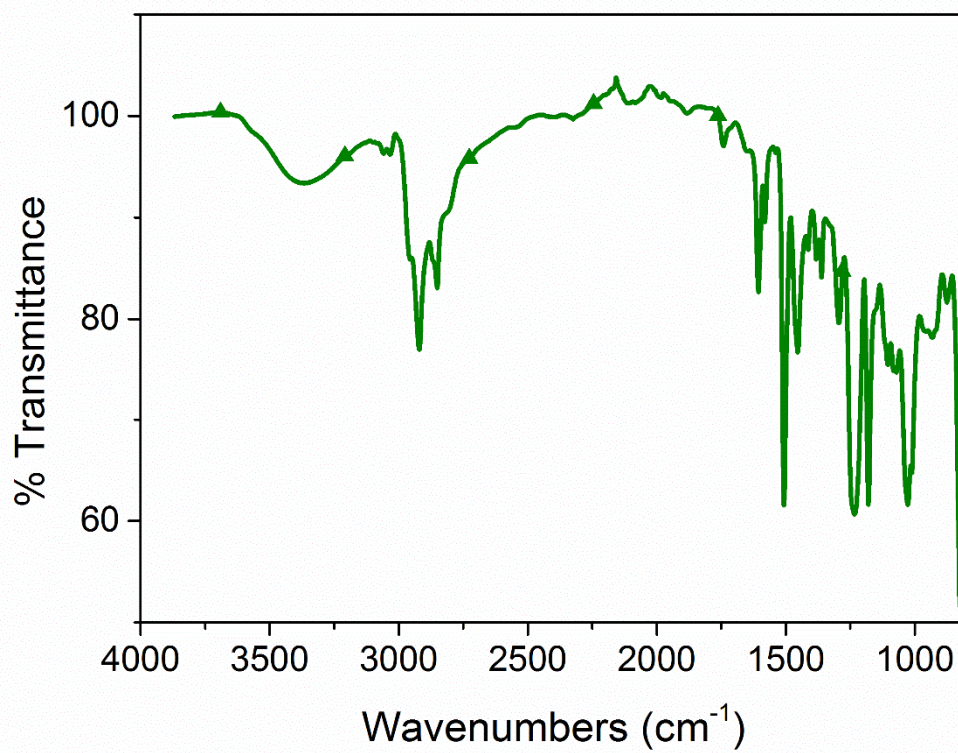
- c. FT-IR of partially bio-based thermosets
i. IPT1-P



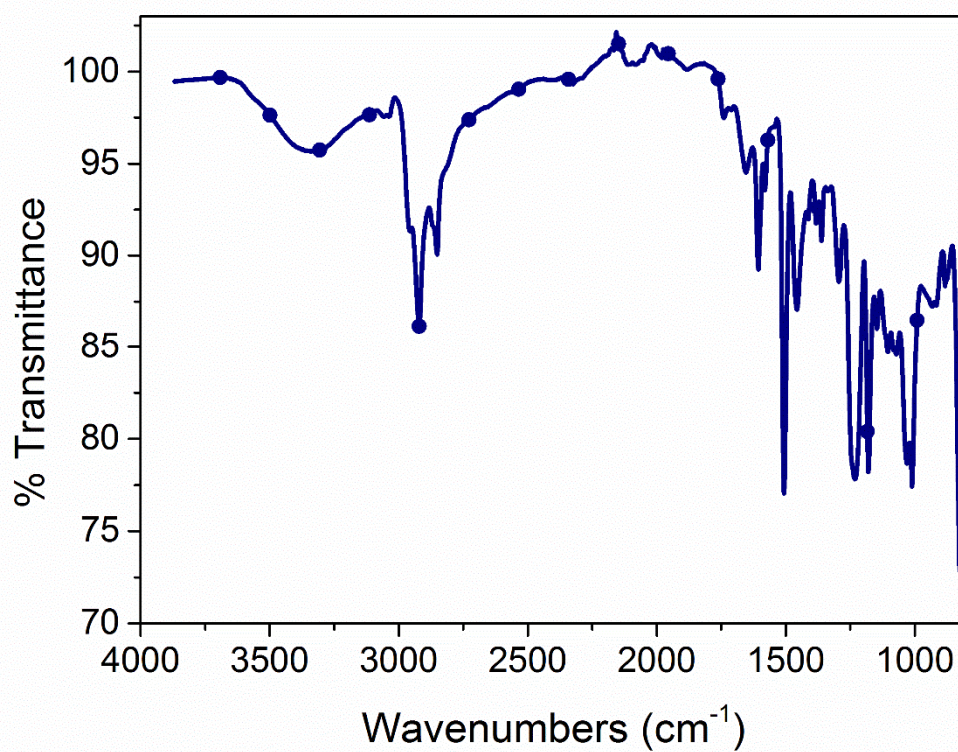
- ii. IPT2-P



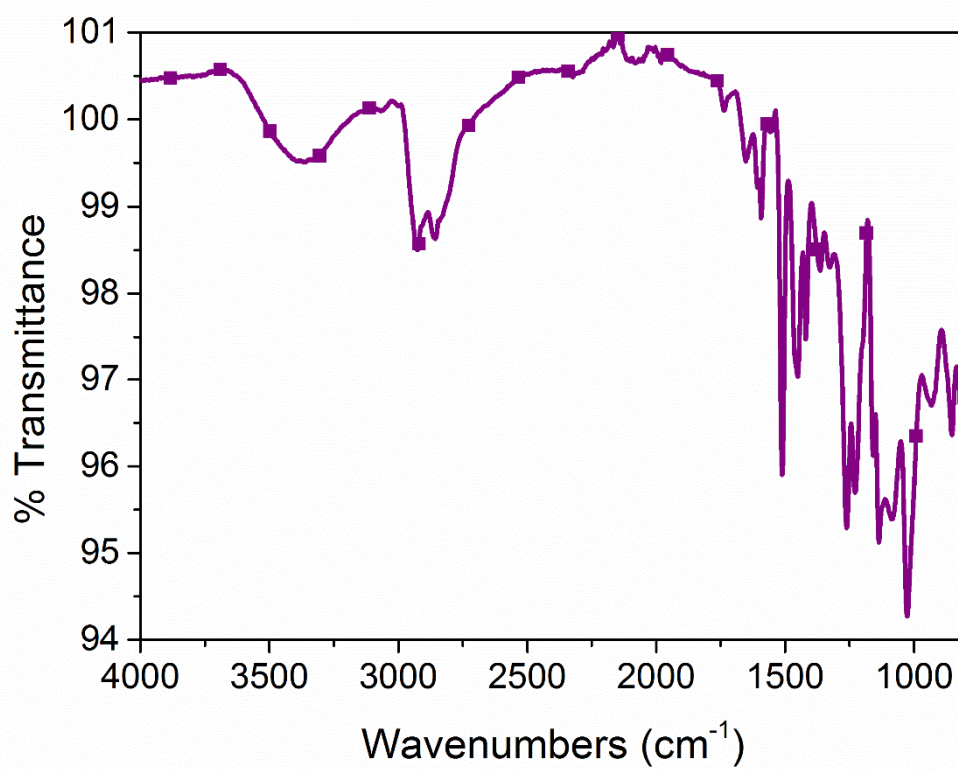
iii. BD-P



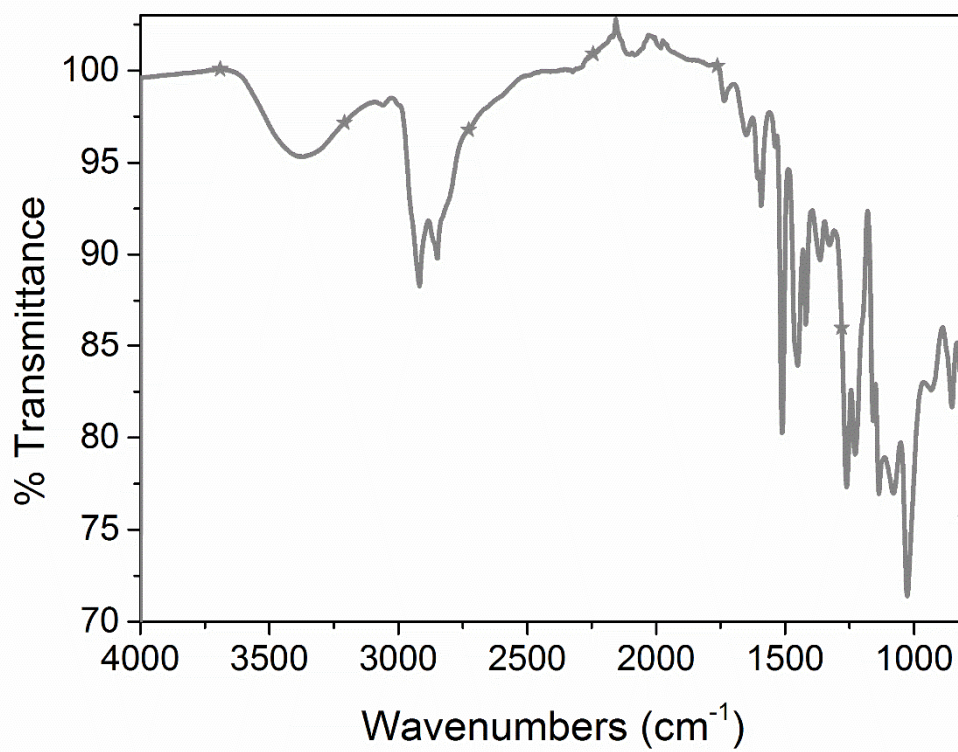
iv. FD-P



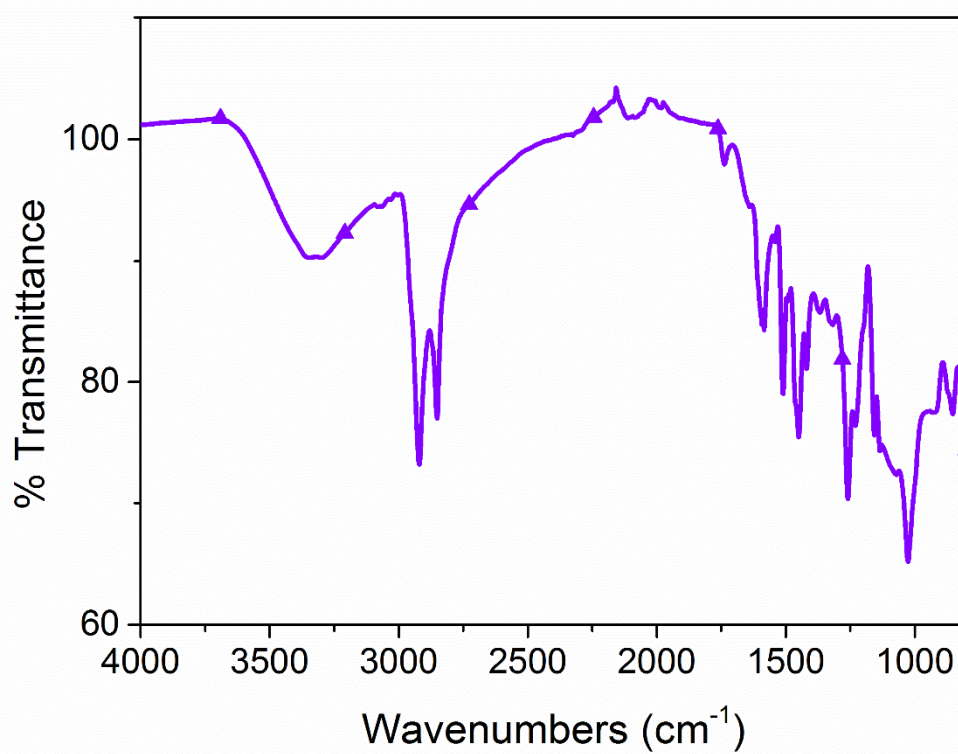
v. IPT1-Bio



vi. IPT2-Bio



vii. BD-Bio



viii. FD-Bio

