

Supporting Information

3D Micro/Nanopatterning of a Vinylferrocene Copolymer

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Table S1. Determination of vinylferrocene to MMA ratio in VFc-MMA-copolymer MVF

# Trial of co-polymerization	Trial 1	Trial 2	Trial 3	Trial 4
Vinylferrocene : MMA (by ^1H NMR)	1 : 3.2	1 : 3.0	1 : 2.7	1 : 2.8
Avg. Vinylferrocene : MMA (by ^1H NMR)	1 : 2.9(2)			
Vinylferrocene : MMA (by IG ^{13}C NMR) ^a	1 : 2.8	1 : 2.8	1 : 2.8	1 : 2.9
Avg. Vinylferrocene : MMA (by IG ^{13}C NMR) ^a	1 : 2.8(1)			
Calculated Formula [VFc : MMA = 1 : 2.8] ^b	$[\text{C}_{12}\text{H}_{12}\text{Fe}]_n[\text{C}_5\text{H}_8\text{O}_2]_{2.8n}$			
Calculated % of Carbon	63.42			
Calculated % of Hydrogen	7.04			
% of Carbon (exp. found)	63.39	63.56	63.46	63.47
% of Hydrogen (exp. found)	7.10	7.17	7.32	7.33
Avg. % of Carbon (exp. found)	63.47(1)			
Avg. % of Hydrogen (exp. found)	7.23(1)			

^a Inverse gated ^{13}C NMR has been termed as IG ^{13}C NMR in this table.

^b these values refer just to the ratio of the main chain. Upon including termination with butyronitrile and/or hydrogen changes these values in a range which is still in agreement with the proposed composition and block ratio: $(\text{CH}_3)_2\text{CNC}-[\text{MMA}]_3[\text{VFc}]\text{-H}$, C%: 64.03, H%: 7.45; $(\text{CH}_3)_2\text{CNC}-[\text{MMA}]_9[\text{VFc}]_3\text{-H}$, C%: 63.56, H%: 7.22; $(\text{CH}_3)_2\text{CNC}-[\text{MMA}]_{15}[\text{VFc}]_5\text{-H}$, C%: 63.45, H%: 7.16; $(\text{CH}_3)_2\text{CNC}-[\text{MMA}]_{60}[\text{VFc}]_{20}\text{-H}$, C%: 63.33, H%: 7.10. N.B.: the IR spectra of MVF (Fig. S6) indicate only marginal bands in the region characteristic for alkyl nitriles (2250 to 2230 cm^{-1}).

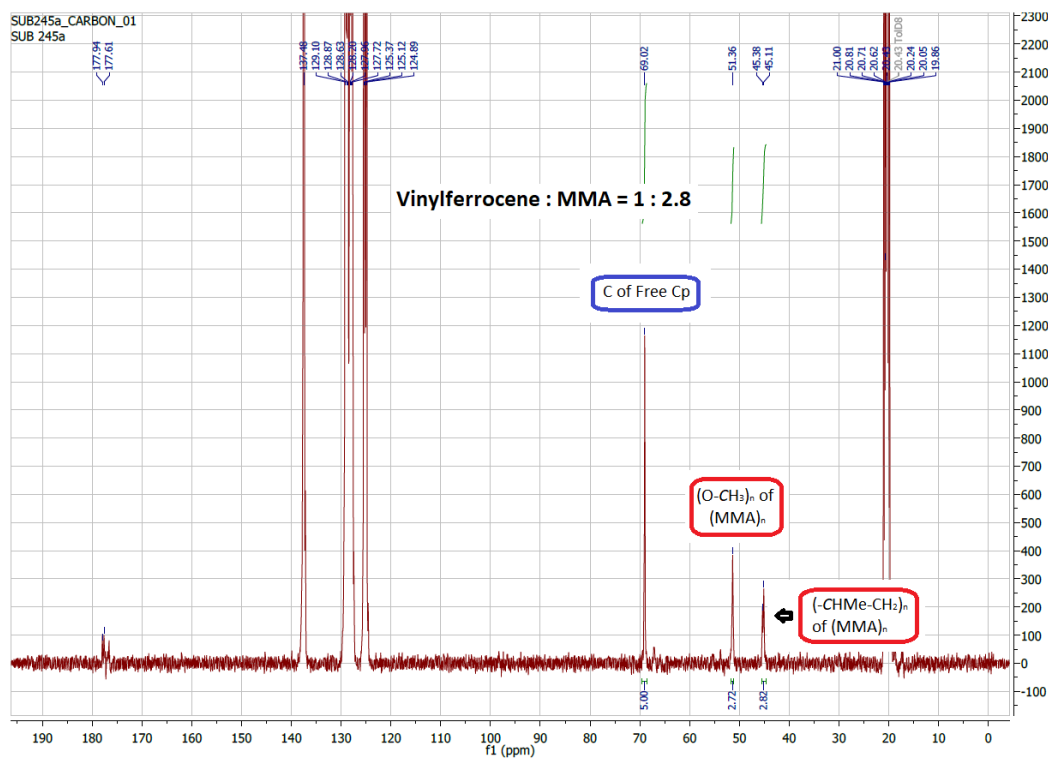
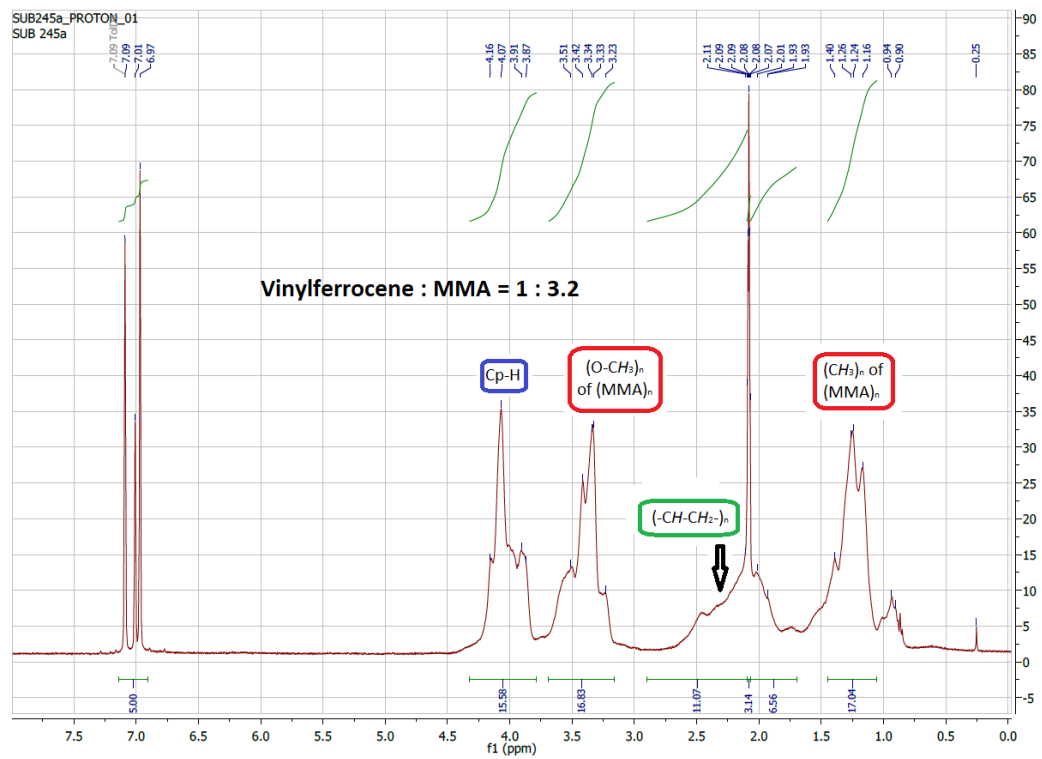


Fig S1. ^1H (top) and inverse gated ^{13}C NMR (bottom) NMR of MVF (in Toluene D_8), obtained in trial 1. [Chemical Analysis: Calculated C, 63.37; H, 7.06. Found C, 63.39; H, 7.10.]

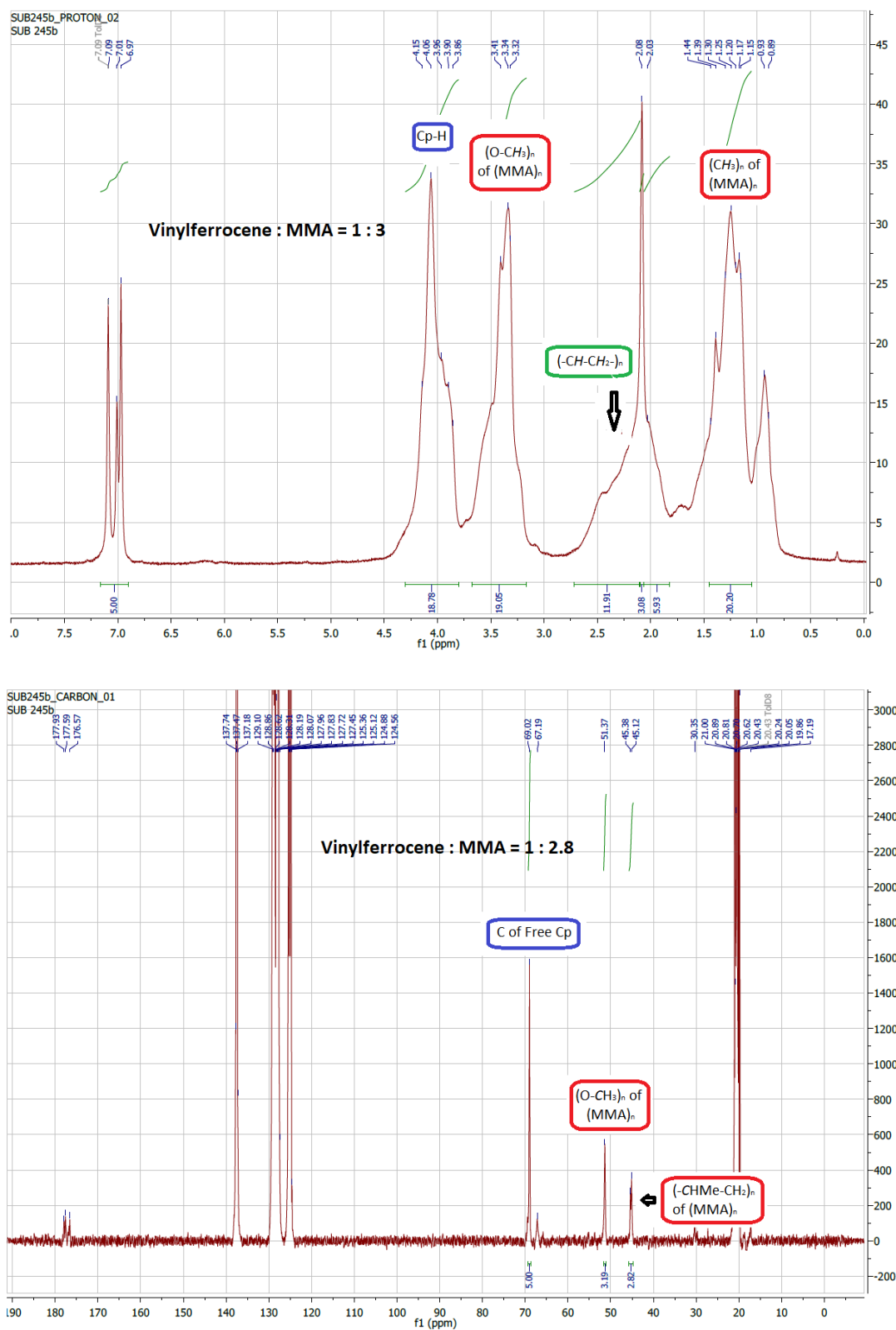


Fig S2. ¹H (top) and inverse gated ¹³C NMR (bottom) NMR of MVF (in Toluene D₈), obtained in trial 2. [Chemical Analysis: Calculated C, 63.37; H, 7.06. Found C, 63.56; H, 7.17.]

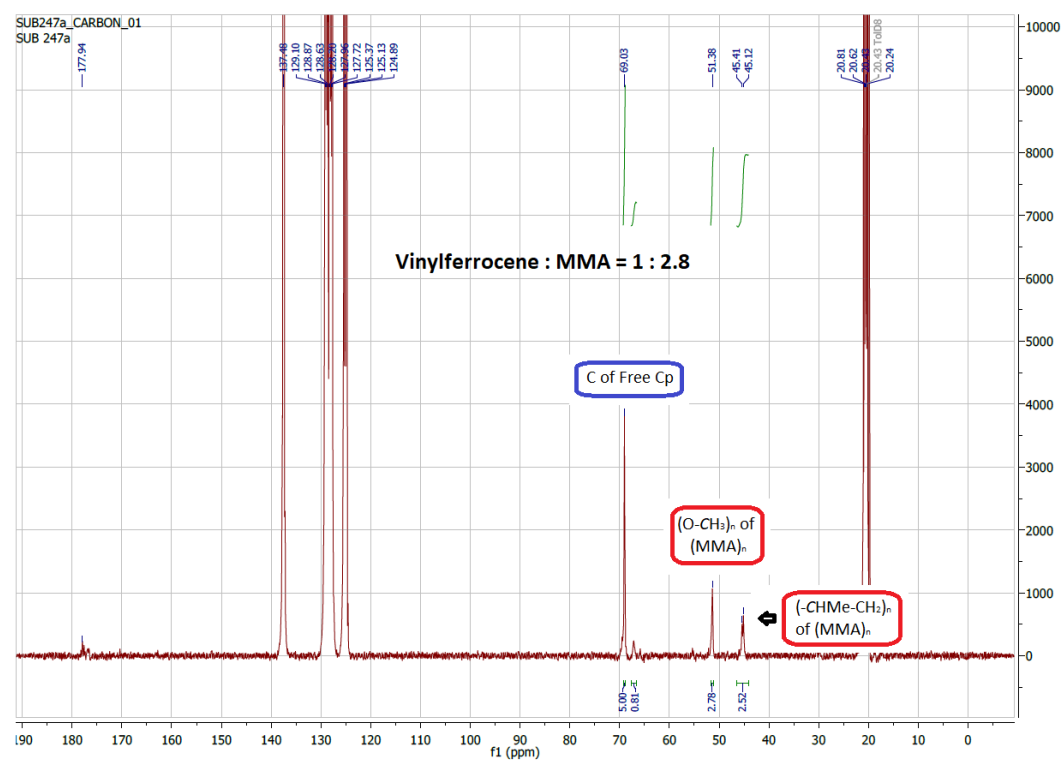
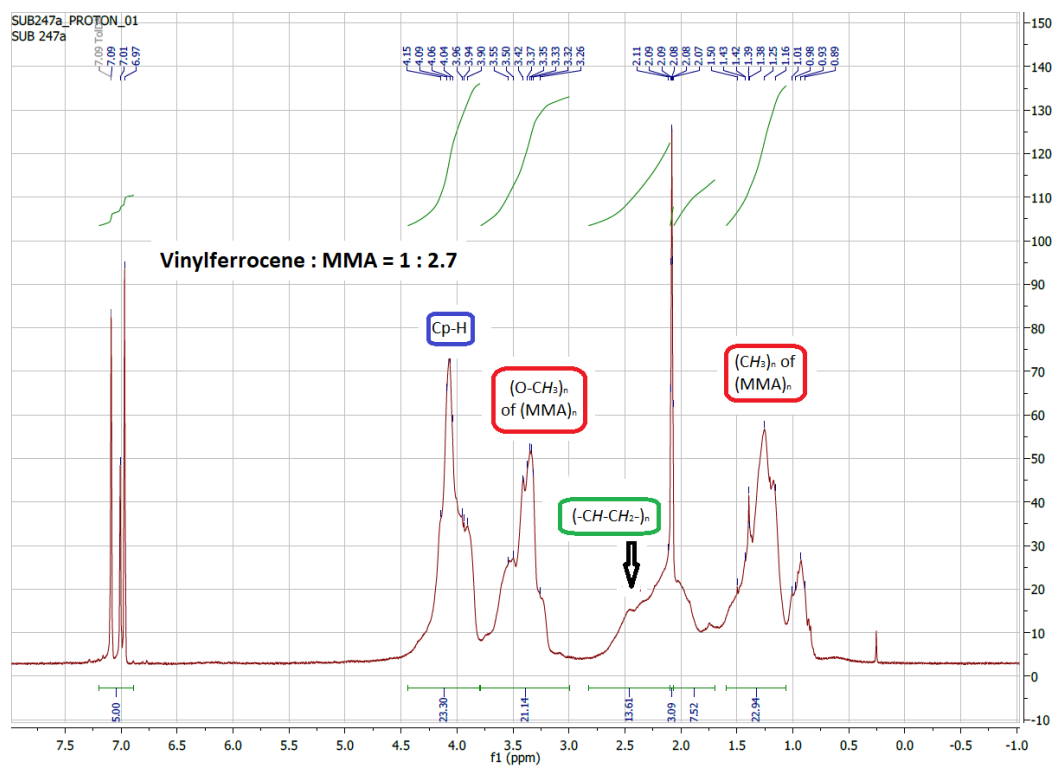


Fig S3. ^1H (top) and inverse gated ^{13}C NMR (bottom) NMR of MVF (in Toluene D₈), obtained in trial 3. [Chemical Analysis: Calculated C, 63.37; H, 7.06. Found C, 63.46; H, 7.32.]

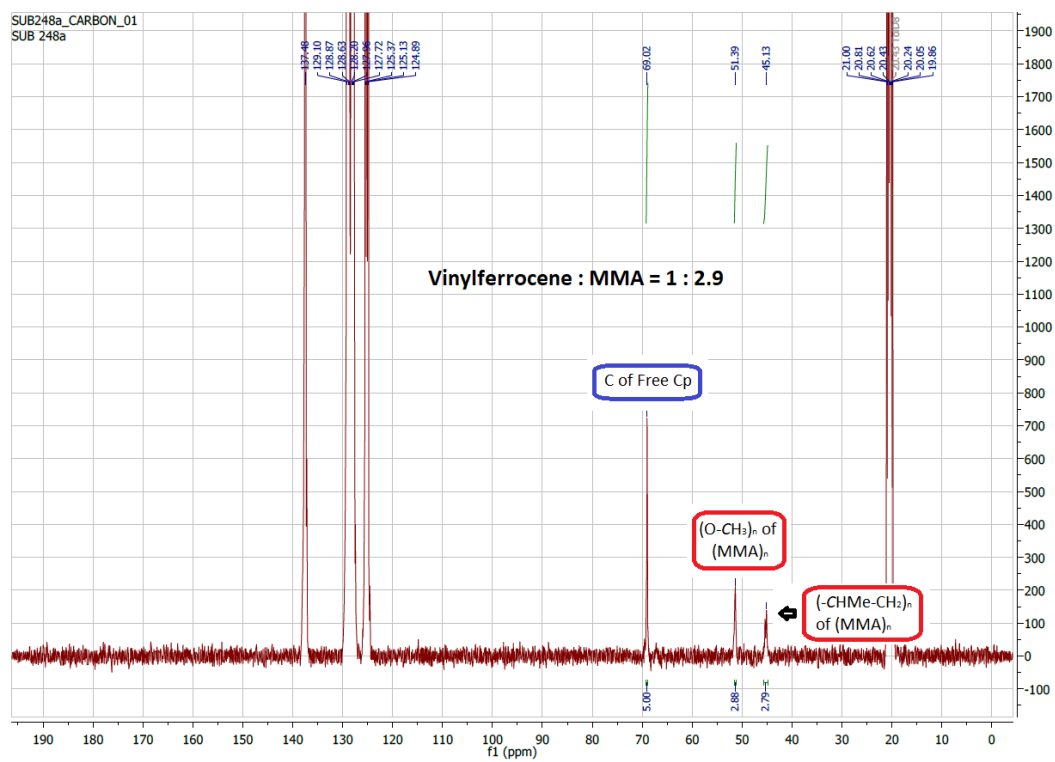
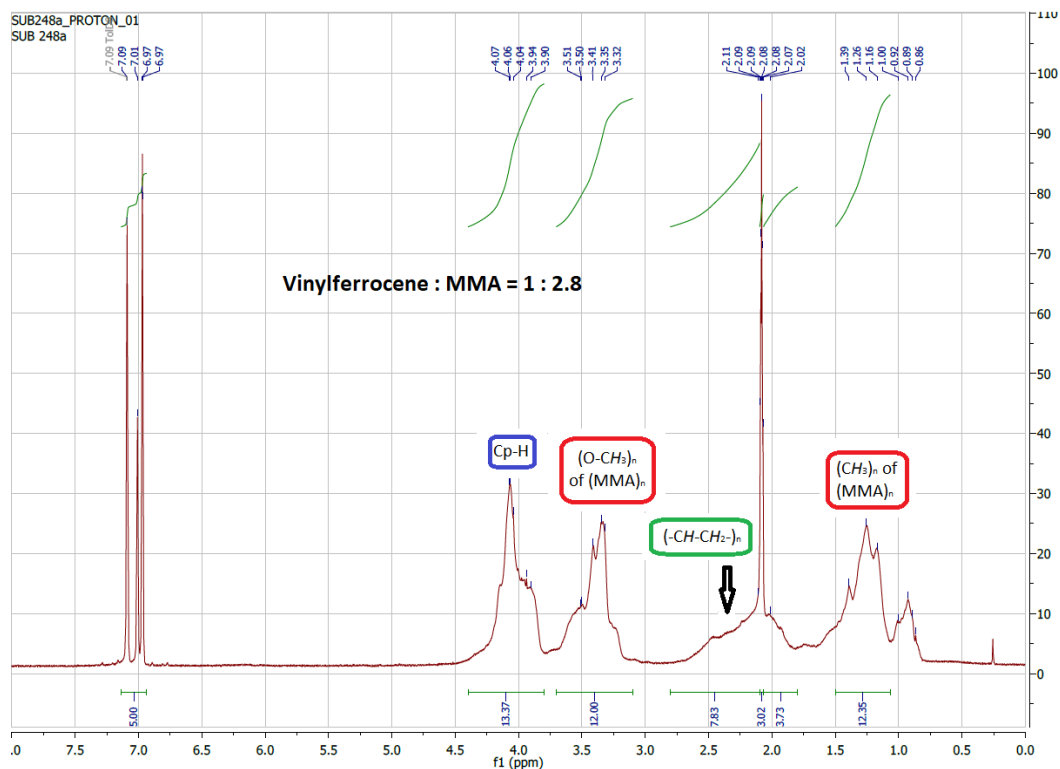


Fig S4. ¹H (top) and inverse gated ¹³C NMR (bottom) NMR of MVF (in Toluene D₈), obtained in trial 4. [Chemical Analysis: Calculated C, 63.37; H, 7.06. Found C, 63.47; H, 7.33.]

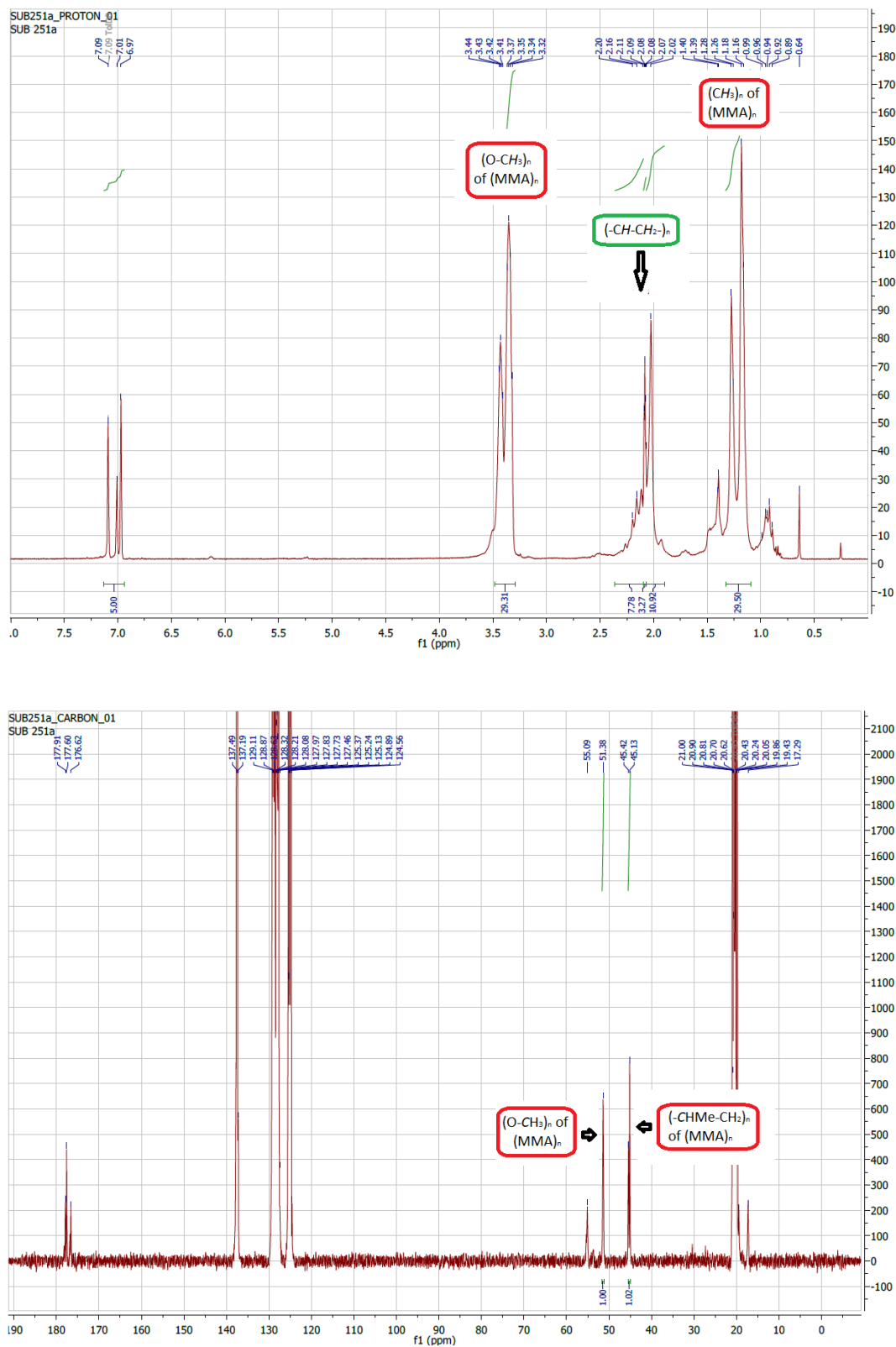


Fig S5. ^1H (top) and inverse gated ^{13}C NMR (bottom) NMR of PMMA (in Toluene D8).

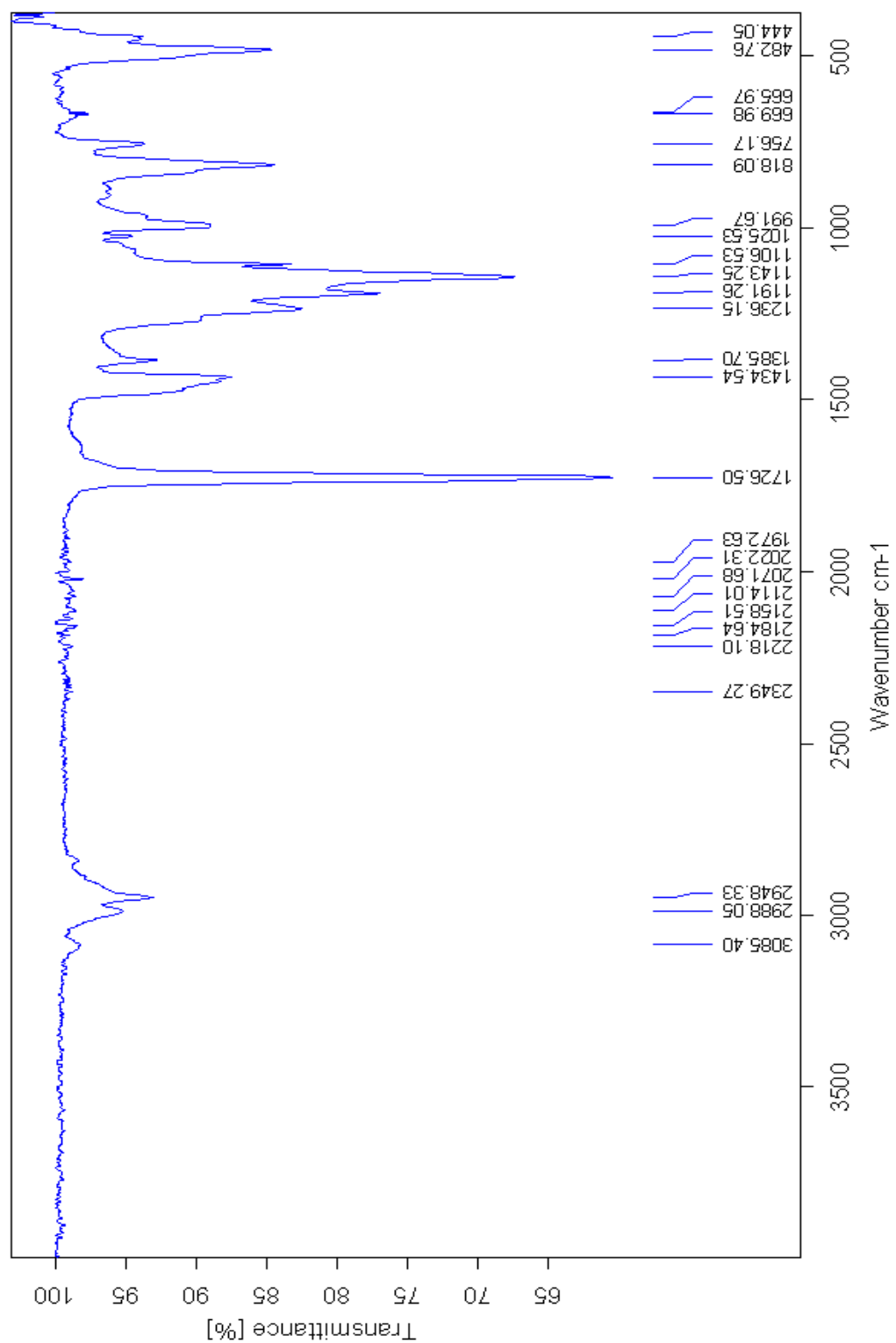


Fig S6. ATR-IR spectrum of MVF.

C:\Programme\OPUS_65\MEAS\MVF.0	MVF	Instrument type and / or accessory	24/04/2020
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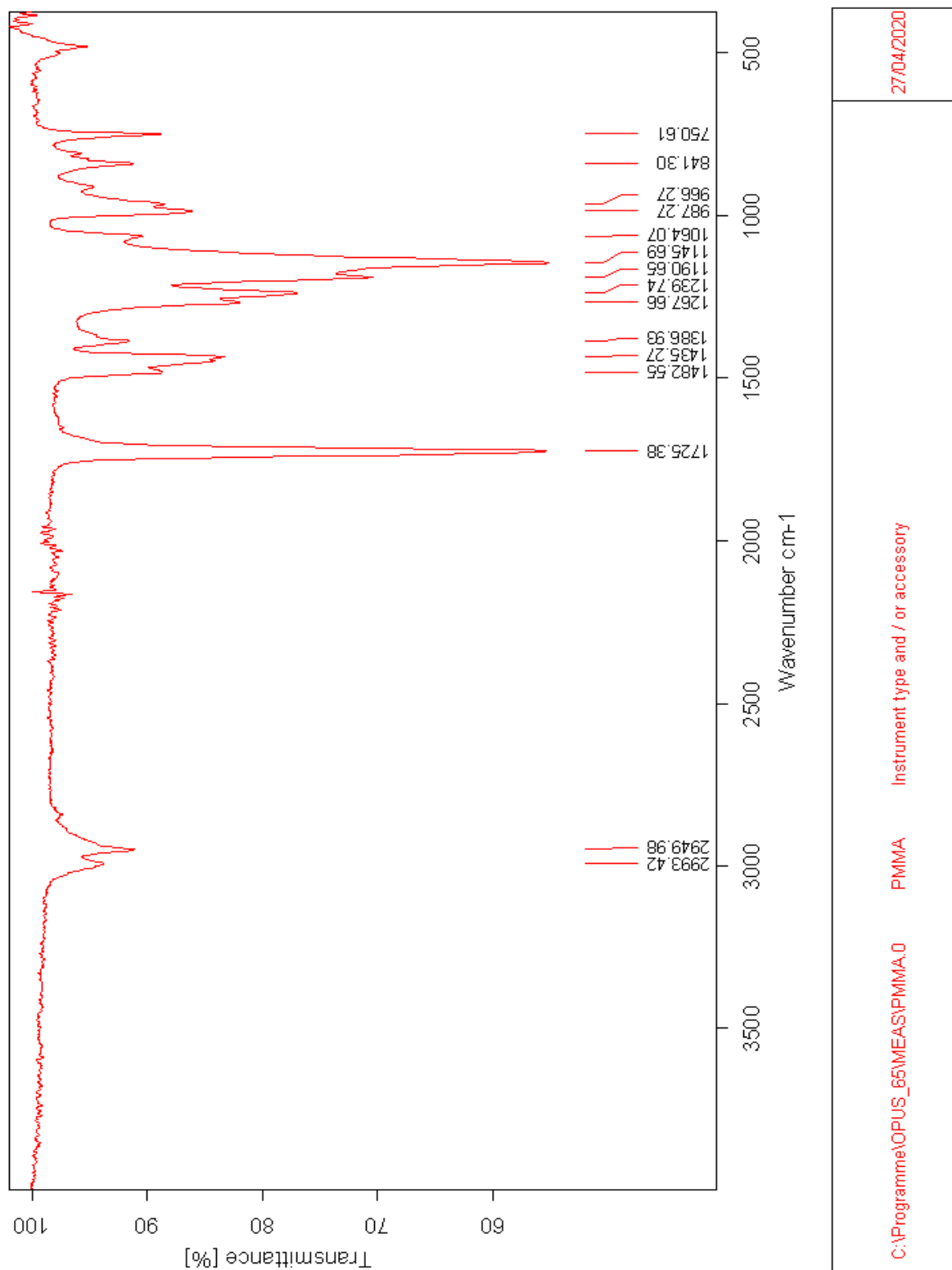


Fig S7. ATR-IR spectrum of PMMA.