Supplementary Materials: Amino Acid-Modified Polyethylenimines with Enhanced Gene Delivery Efficiency and Biocompatibility

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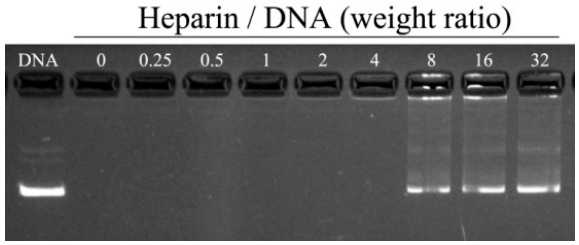


Figure S1. Agarose gel retardation electrophoresis assay for release of DNA from polyplex in the presence of heparin at different weight ratio (heparin/DNA: 0, 0.25, 0.5, 1, 2, 4, 8, 16, 32; Ga-PEI/DNA: *w*/*w* = 3). The first lane is DNA control.

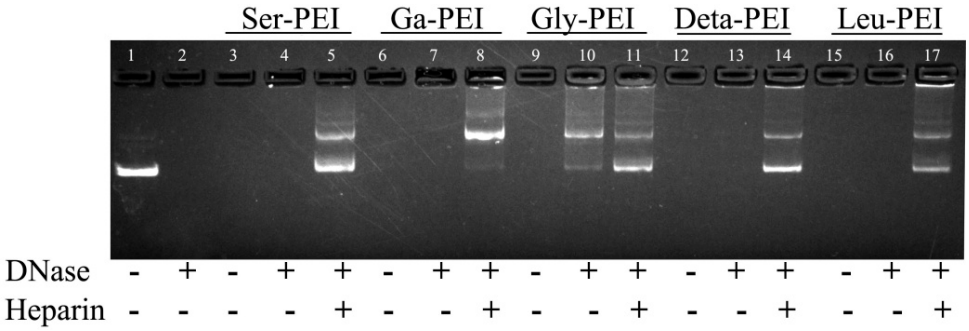


Figure S2. DNA protection against degradation by DNase. Lane 1: naked DNA; Lane 2: DNA treated with DNase for 2 h; Lane 3, 6, 9, 12, 15: polyplex (Polymer/DNA: *w*/*w* = 3); Lane 4, 7, 10, 13, 16: polyplex with DNase for 2 h at 37 °C; Lane 5, 8, 11, 14, 17: polyplex with DNase for 2 h at 37 °C followed by heat-inactivation of DNase and then treated with heparin.

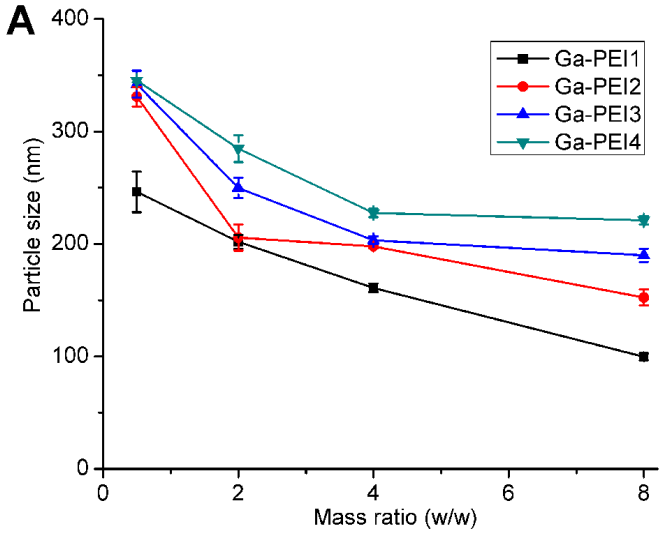


Figure 3. *Cont.*

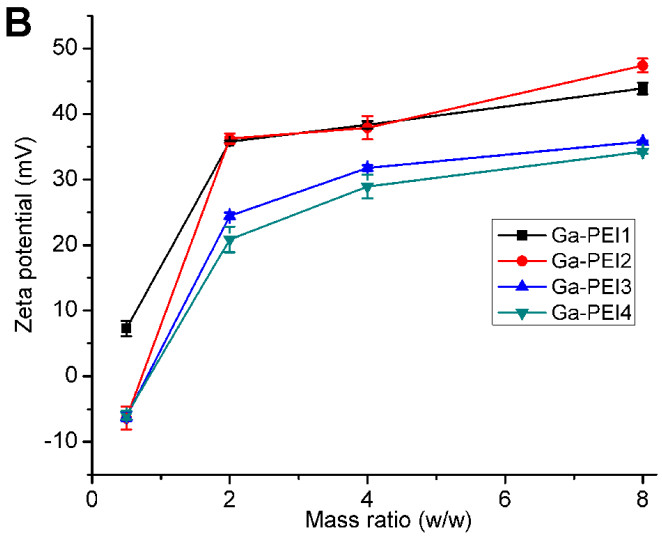


Figure S3. Particle size (**A**) and zeta potential (**B**) of polyplexes formed from Ga-PEI with different DS by DLS. Data represent mean ± SD (n = 3).

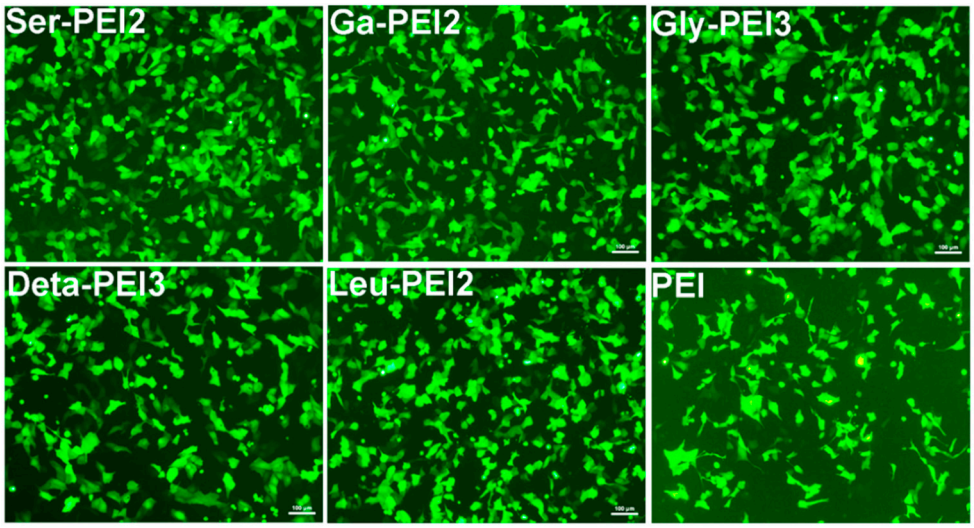


Figure S4. Fluorescence microscope images of pEGFP-transfected U-2OS cells in the presence of 10% serum at optimal weight ratio.

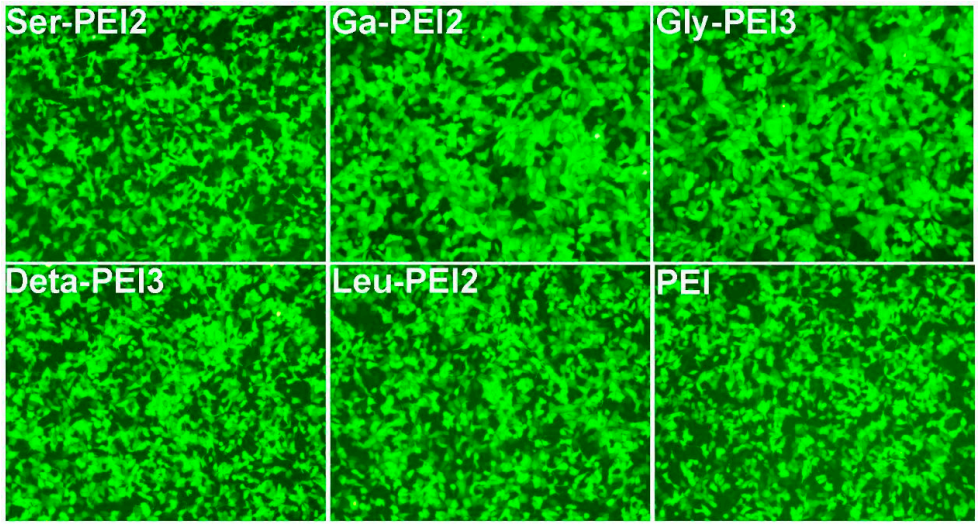


Figure S5. Fluorescence microscope images of pEGFP-transfected 293 cells in the absence of serum at optimal weight ratio.

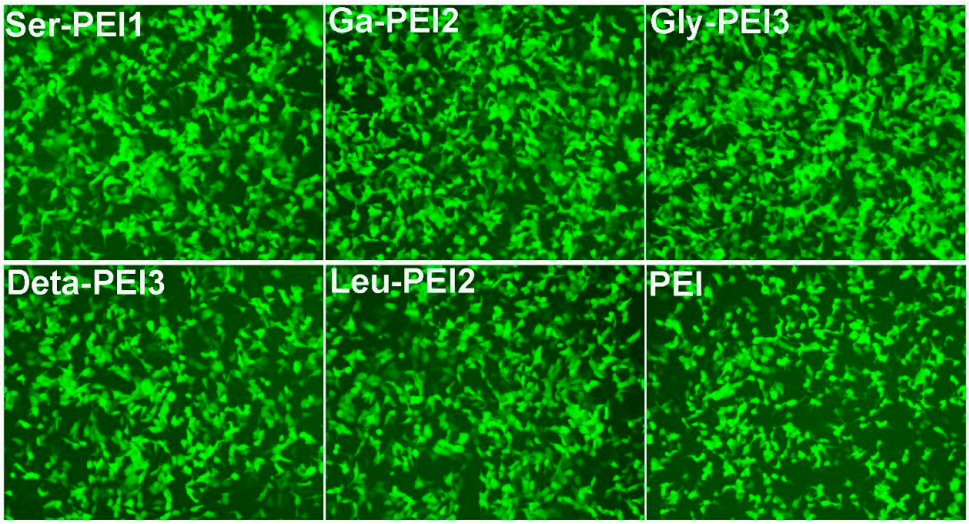


Figure S6. Fluorescence microscope images of pEGFP-transfected 293 cells in the presence of 10% serum at optimal weight ratio.

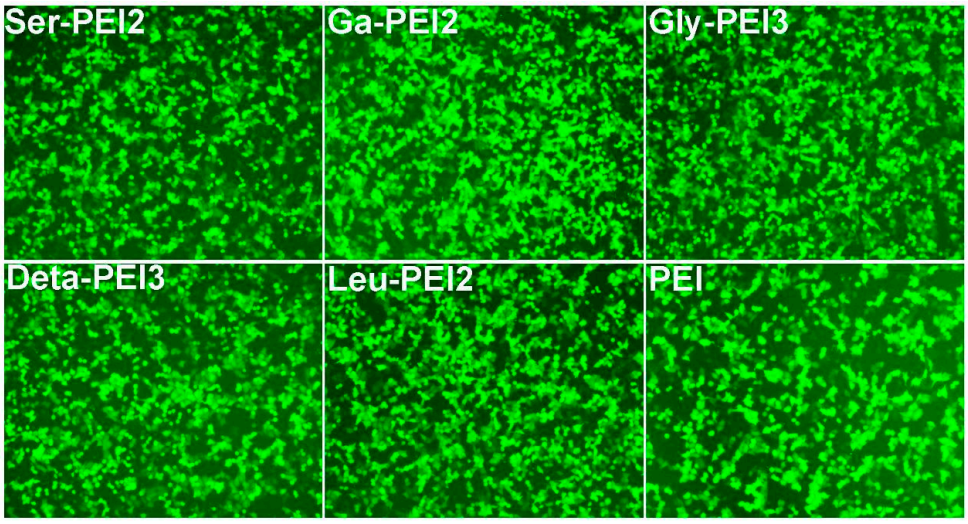


Figure S7. Fluorescence microscope images of pEGFP-transfected HeLa cells in the absence of serum at optimal weight ratio.

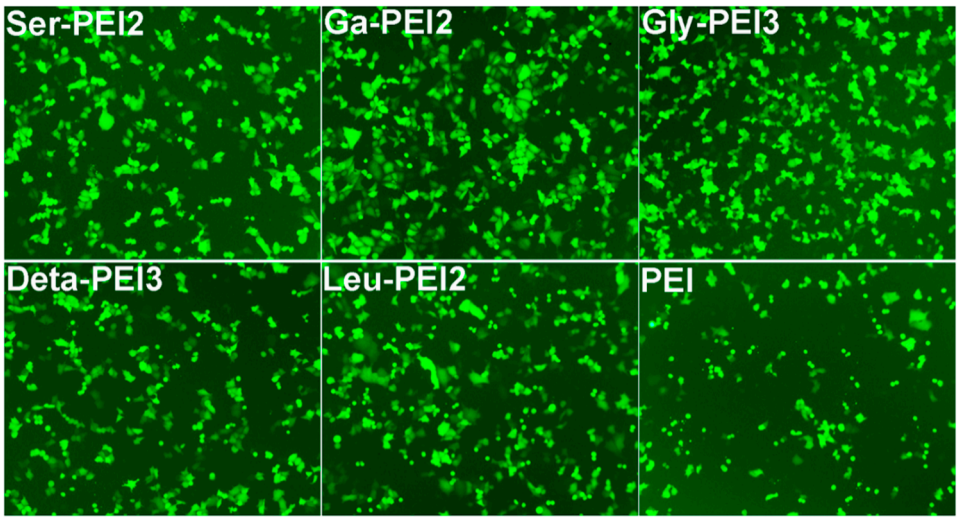


Figure S8. Fluorescence microscope image of pEGFP-transfected HeLa cells in the presence of 10% serum at optimal weight ratio.

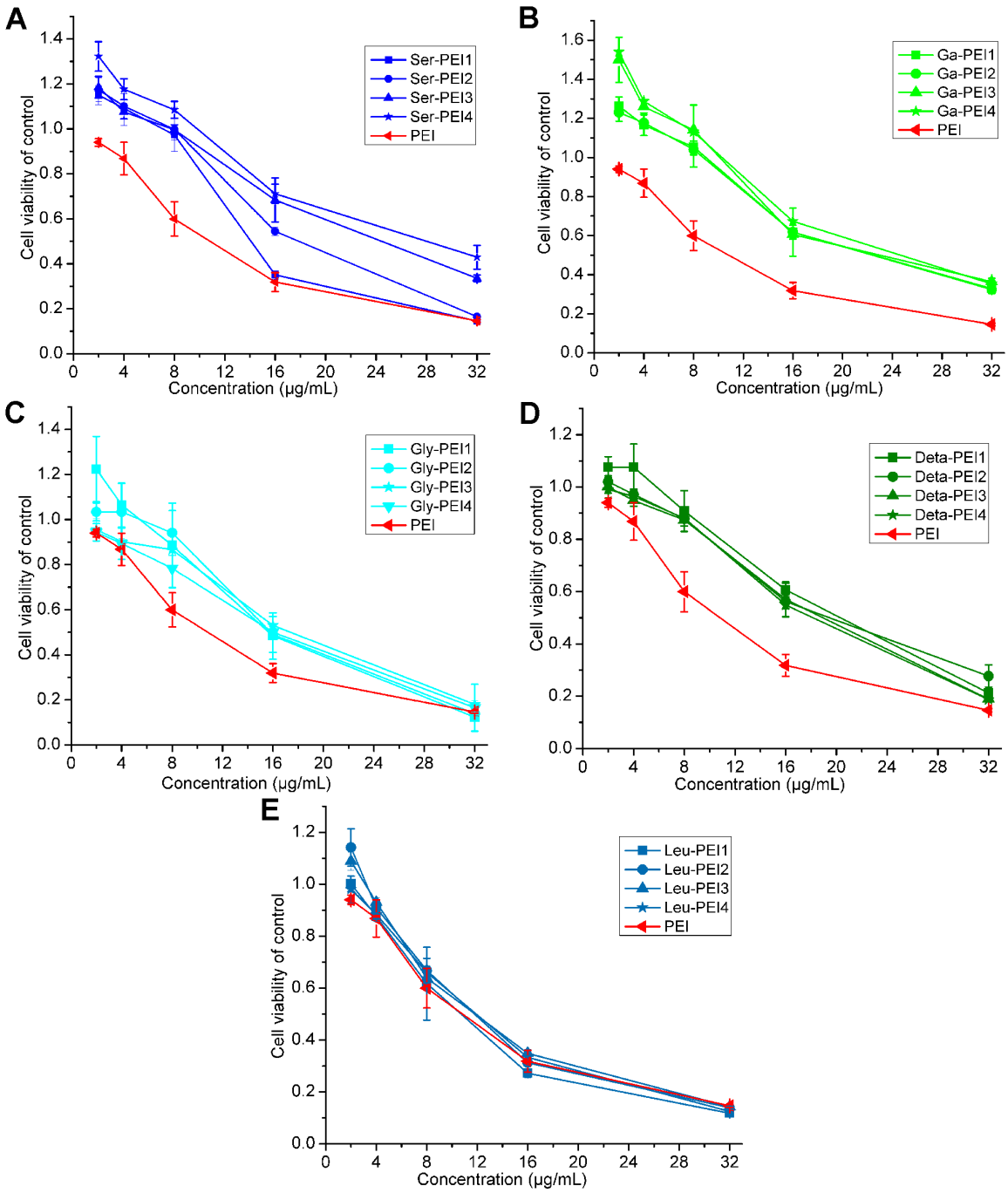
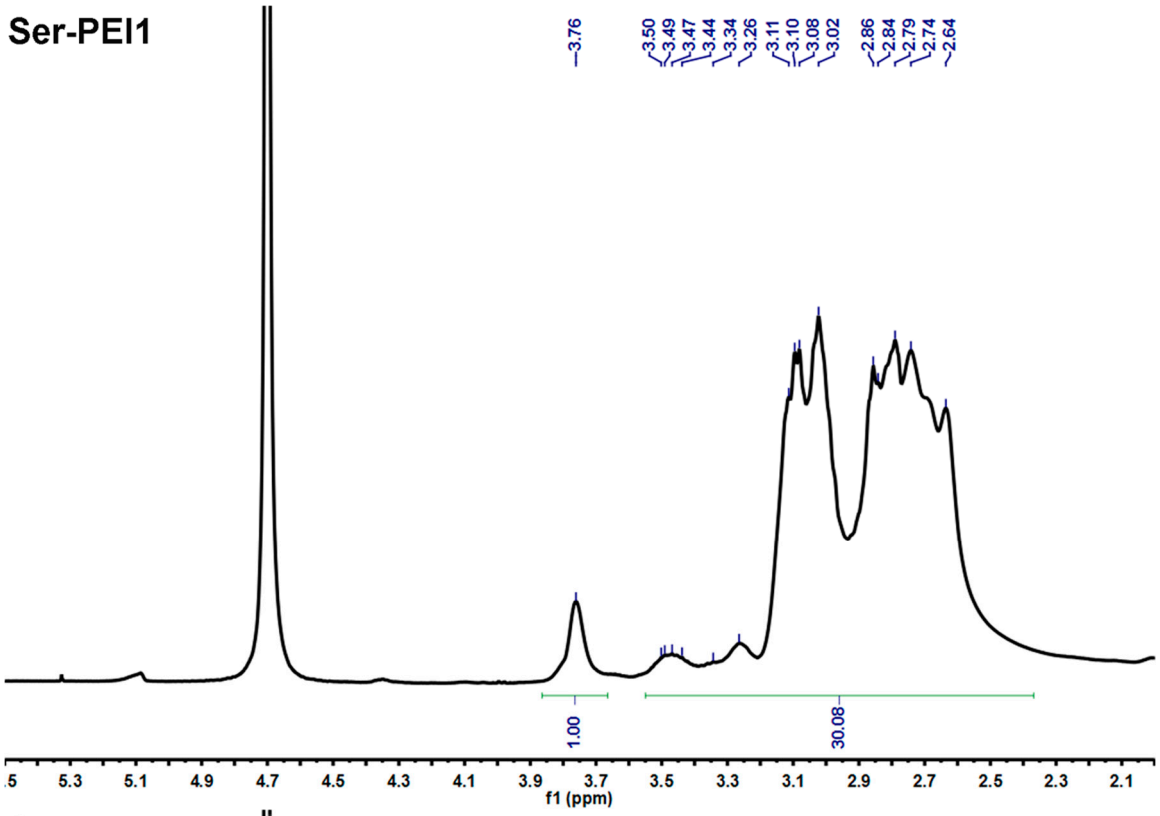
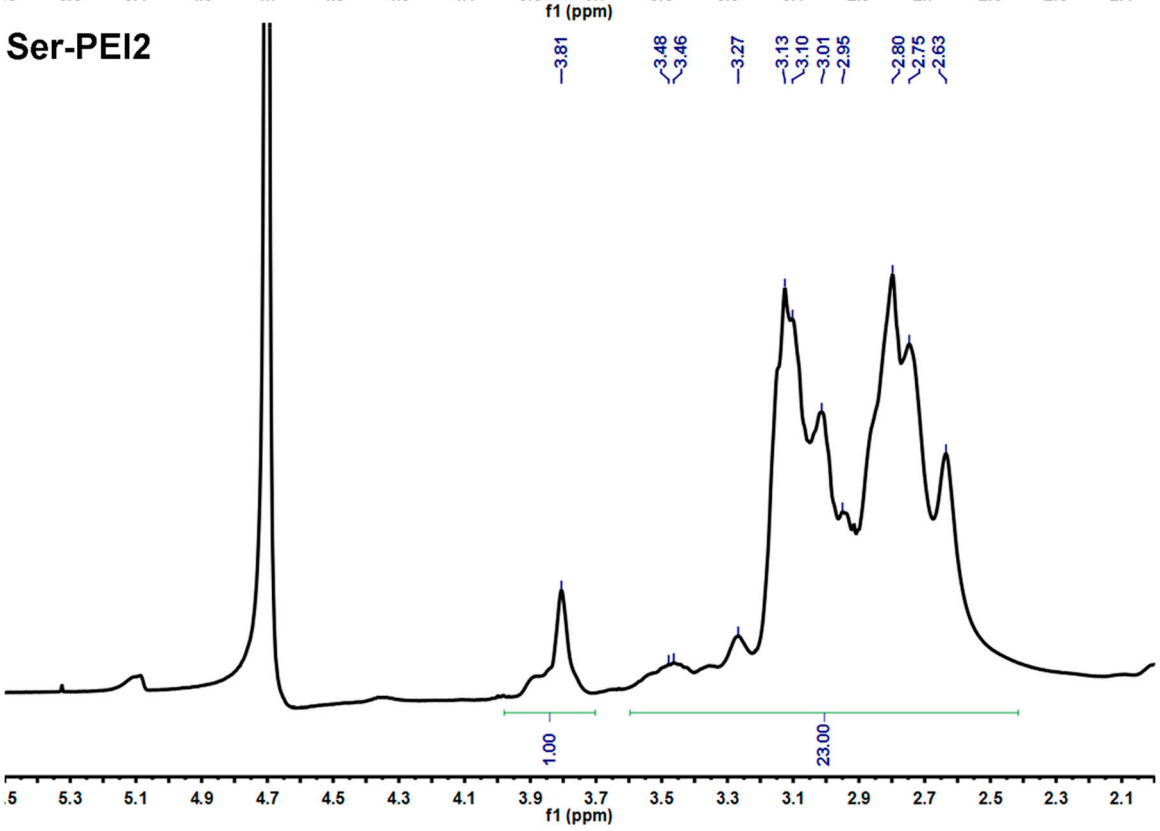
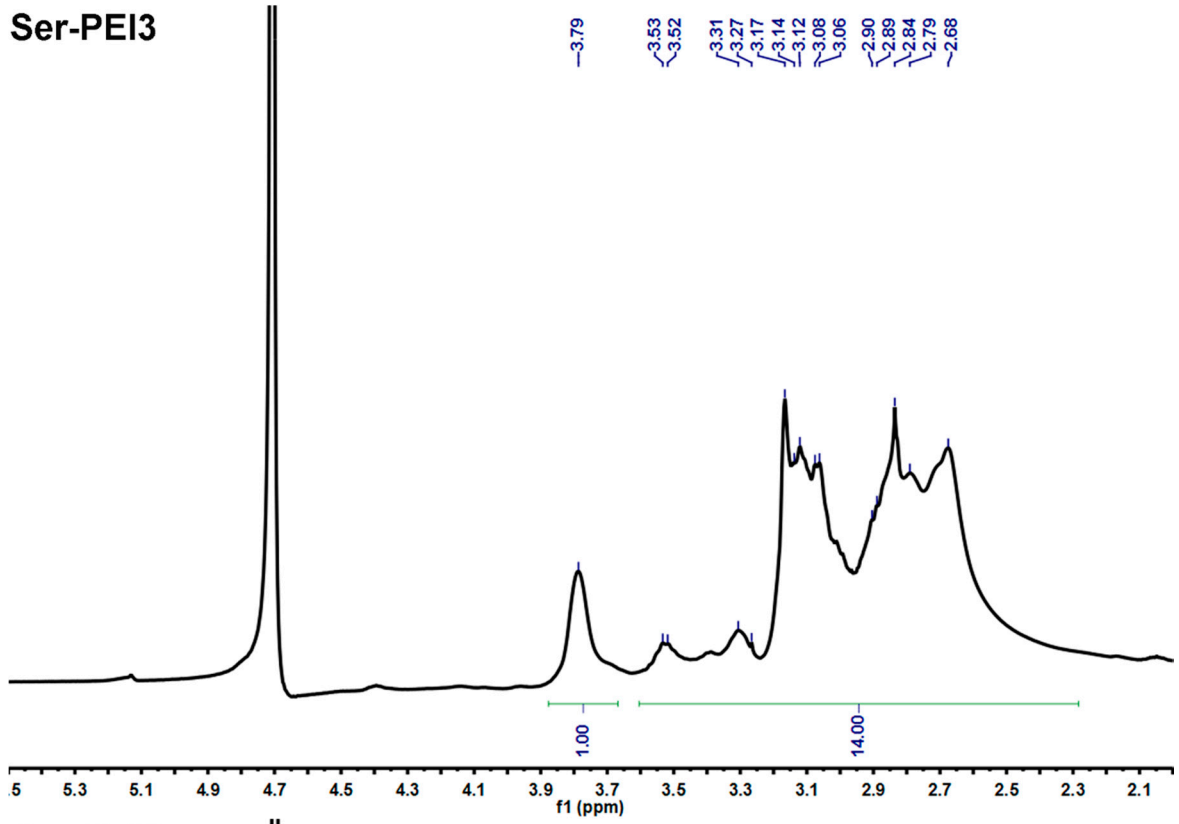


Figure S9. Cytotoxicity of polycations at different concentration toward U-2OS cells: effect of DS. Data represent mean ± SD (n = 3).

^{1}H NMR Spectra:






Ser-PEI3
3.79
3.53
3.52
3.31
3.27
3.17
3.14
3.12
3.08
3.06
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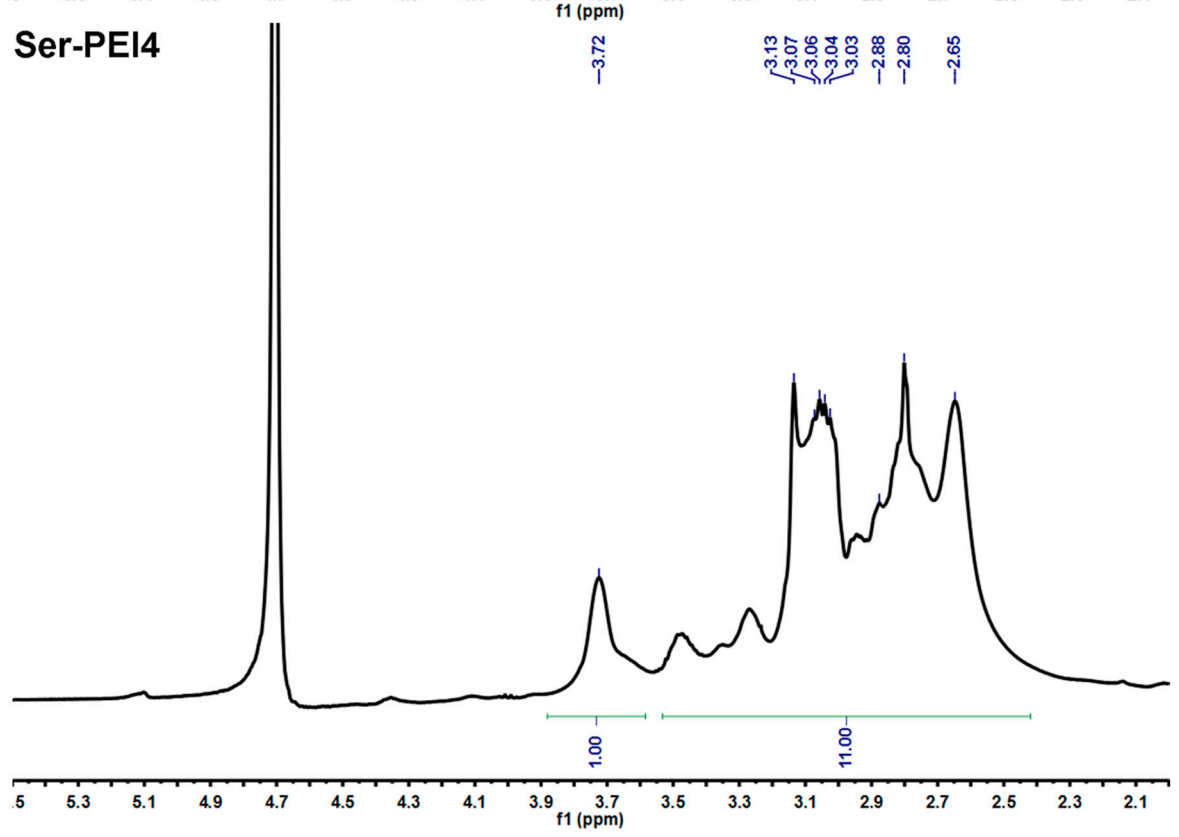
2.84
2.79
2.68
1.00
14.00
f1 (ppm)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3.06
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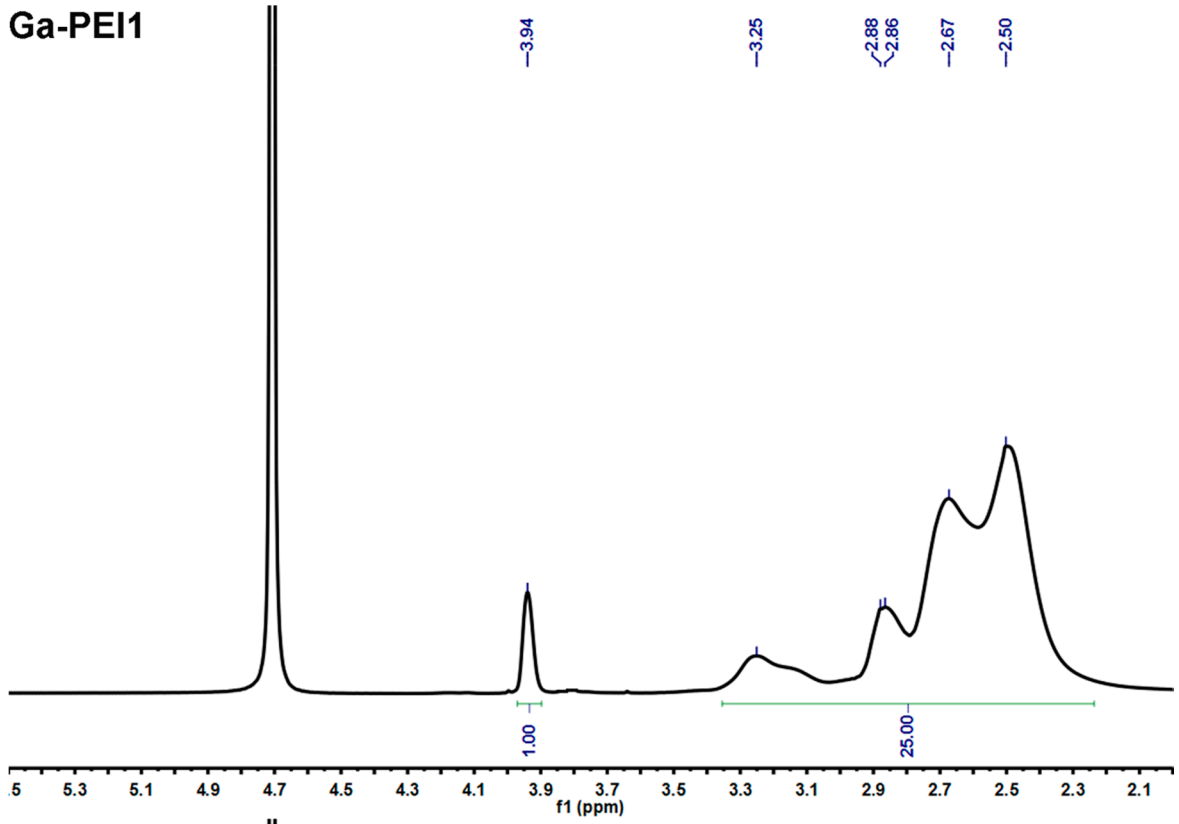
f1 (ppm)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3.25
2.88
2.86
2.67
2.50
1.00
25.00
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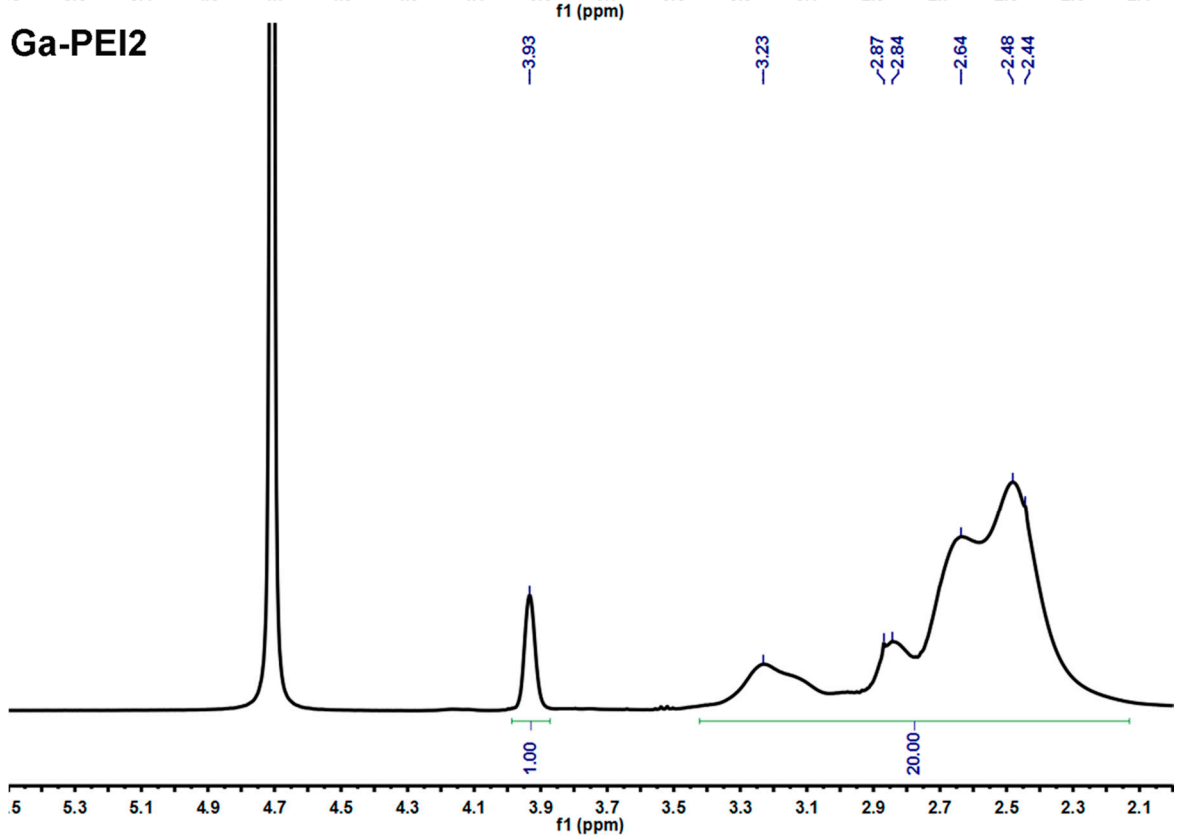
f1 (ppm)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3.23
2.87
2.84
2.64
2.48
2.44
1.00
20.00
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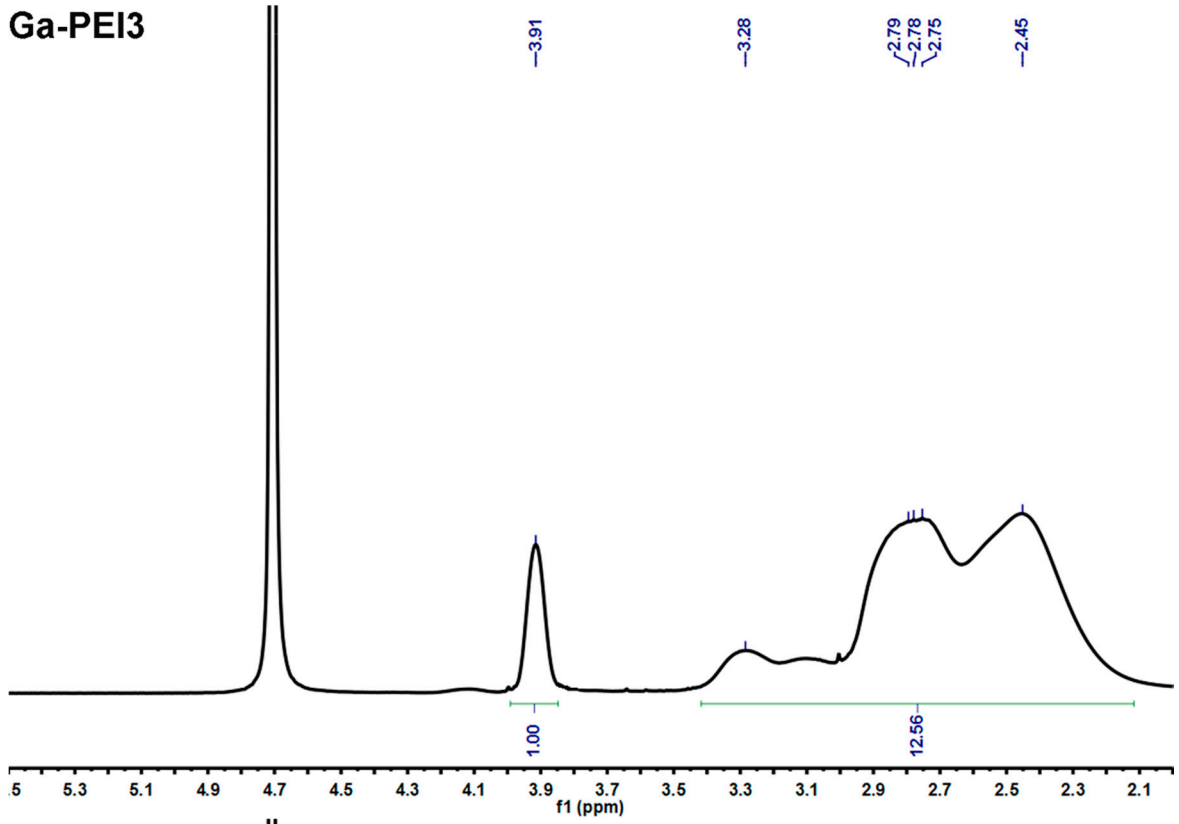
f1 (ppm)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2.79
2.78
2.75
2.45
1.00
12.56
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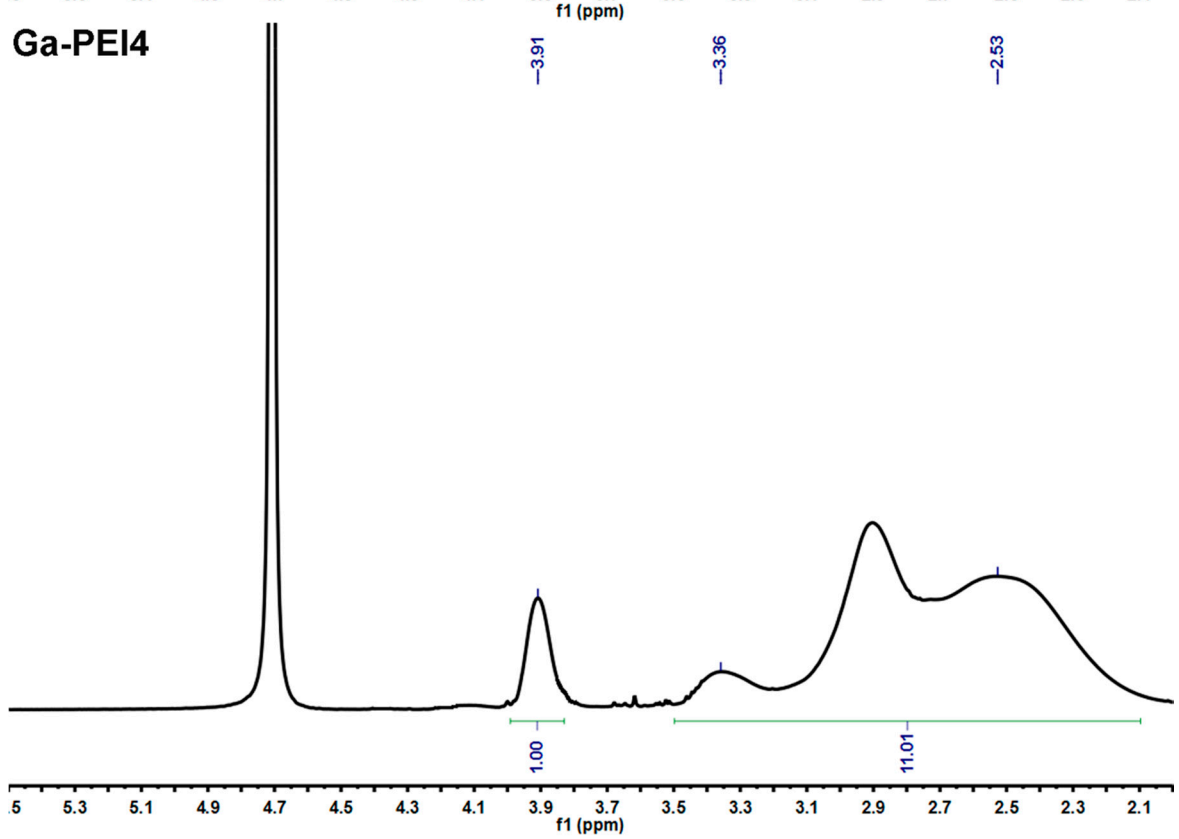
f1 (ppm)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1.00
11.01
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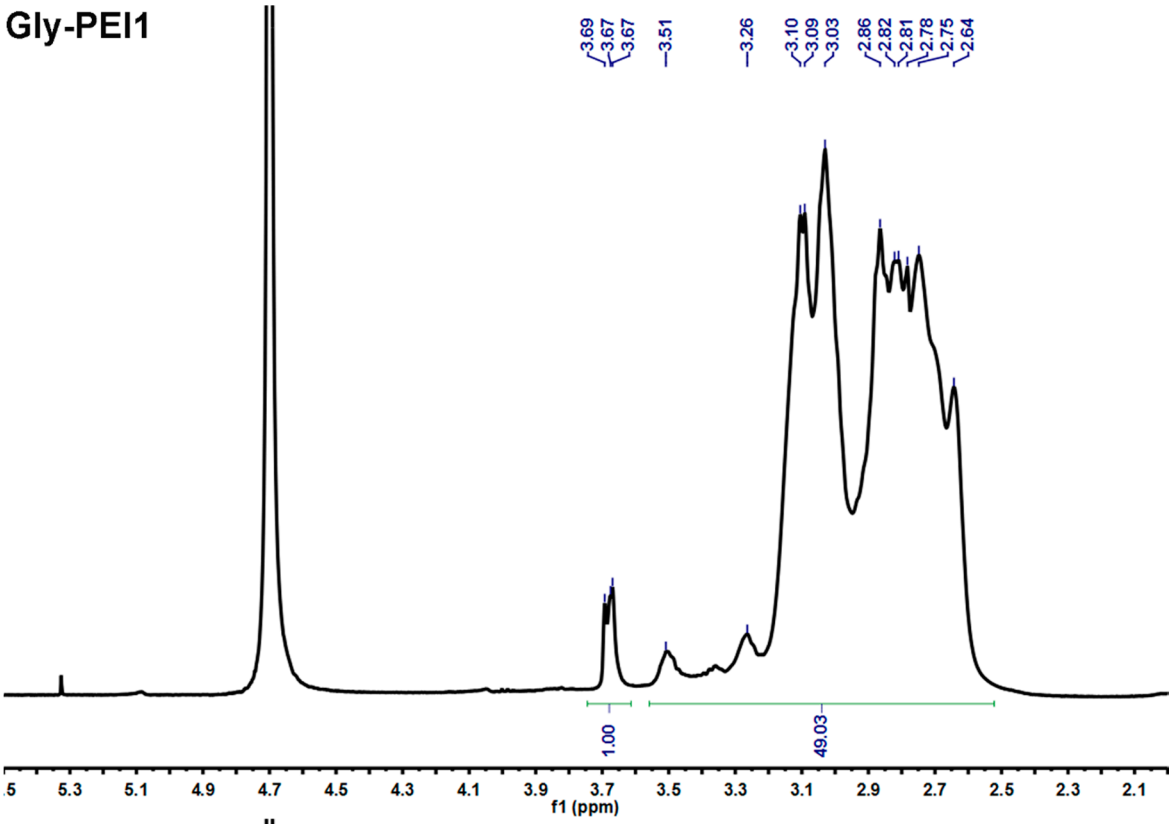
f1 (ppm)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2.78
2.75
2.64
1.00
49.03
5
5.3
5.1
4.9
4.7
4.5
4.3
4.1
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3.5
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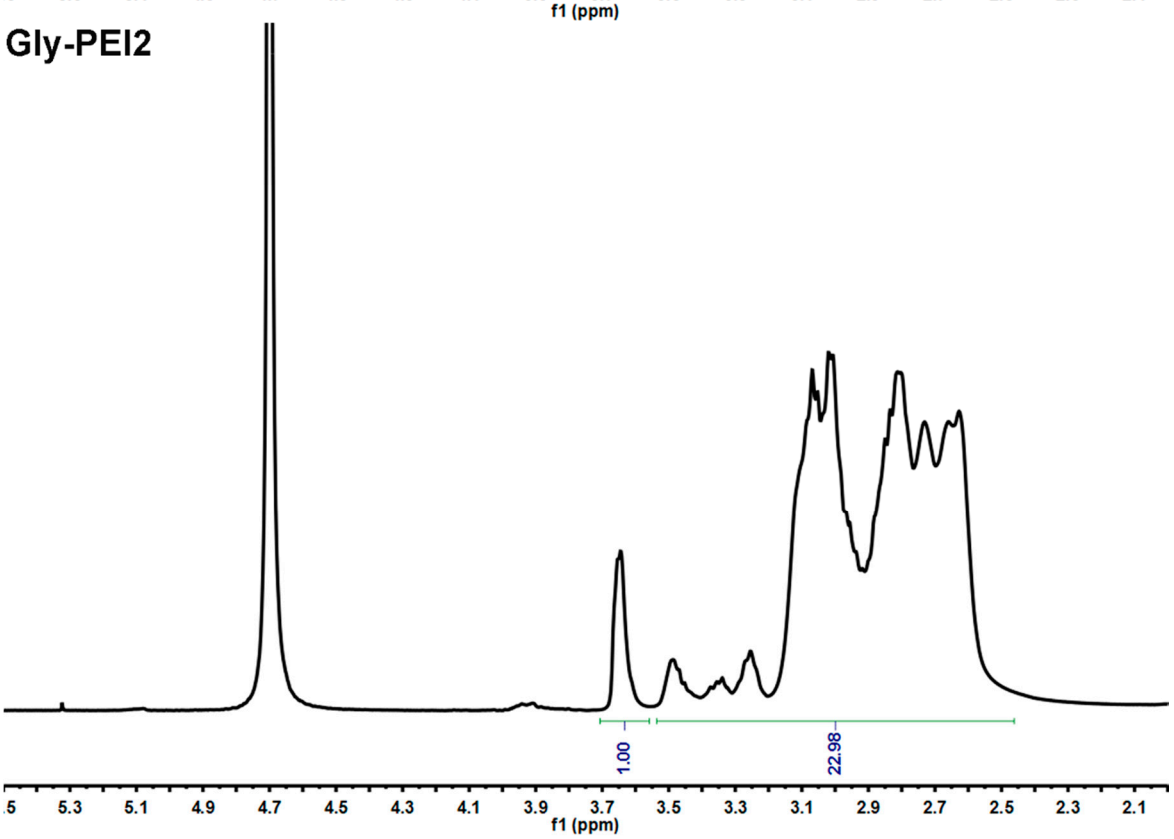
3.1
2.9
2.7
2.5
2.3
2.1
f1 (ppm)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5
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5.1
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4.3
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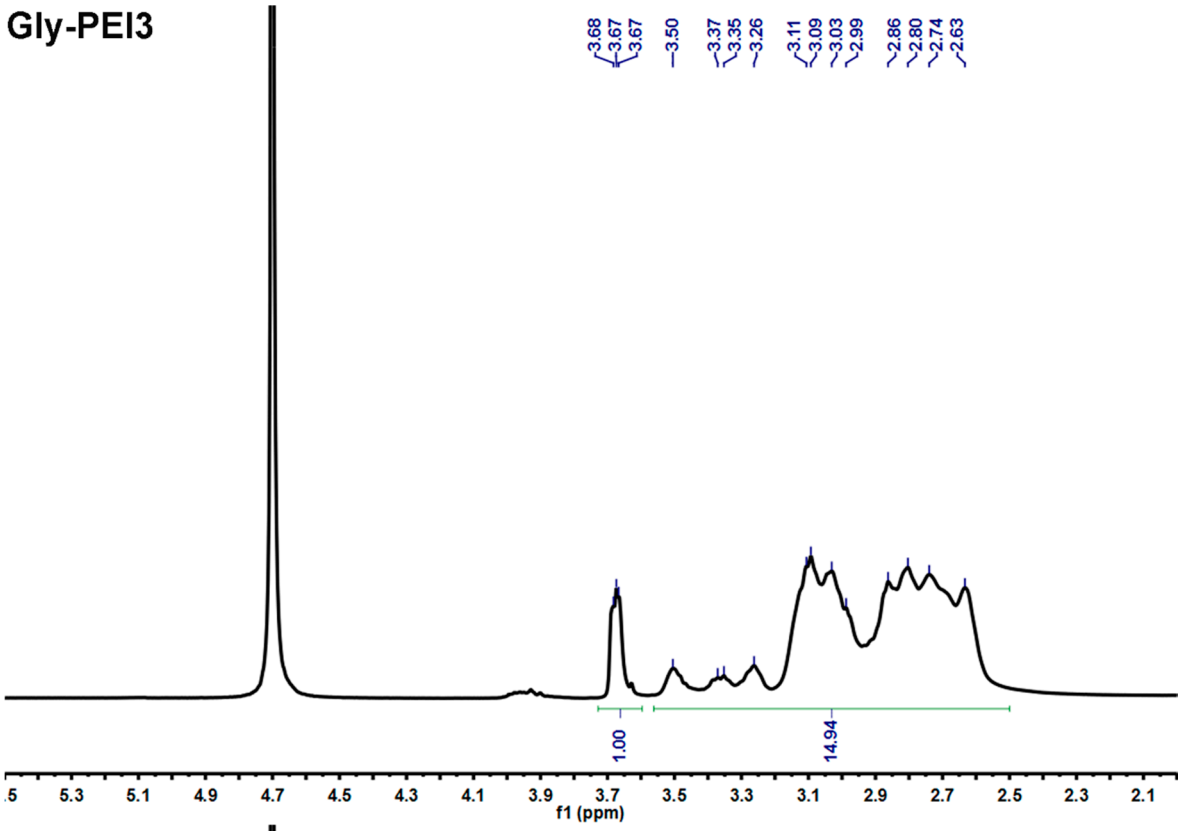
2.7
2.5
2.3
2.1
f1 (ppm)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3.09
3.03
2.99
2.86
2.80
2.74
2.63
1.00
14.94
5.3
5.1
4.9
4.7
4.5
4.3
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3.9
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3.1
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2.5
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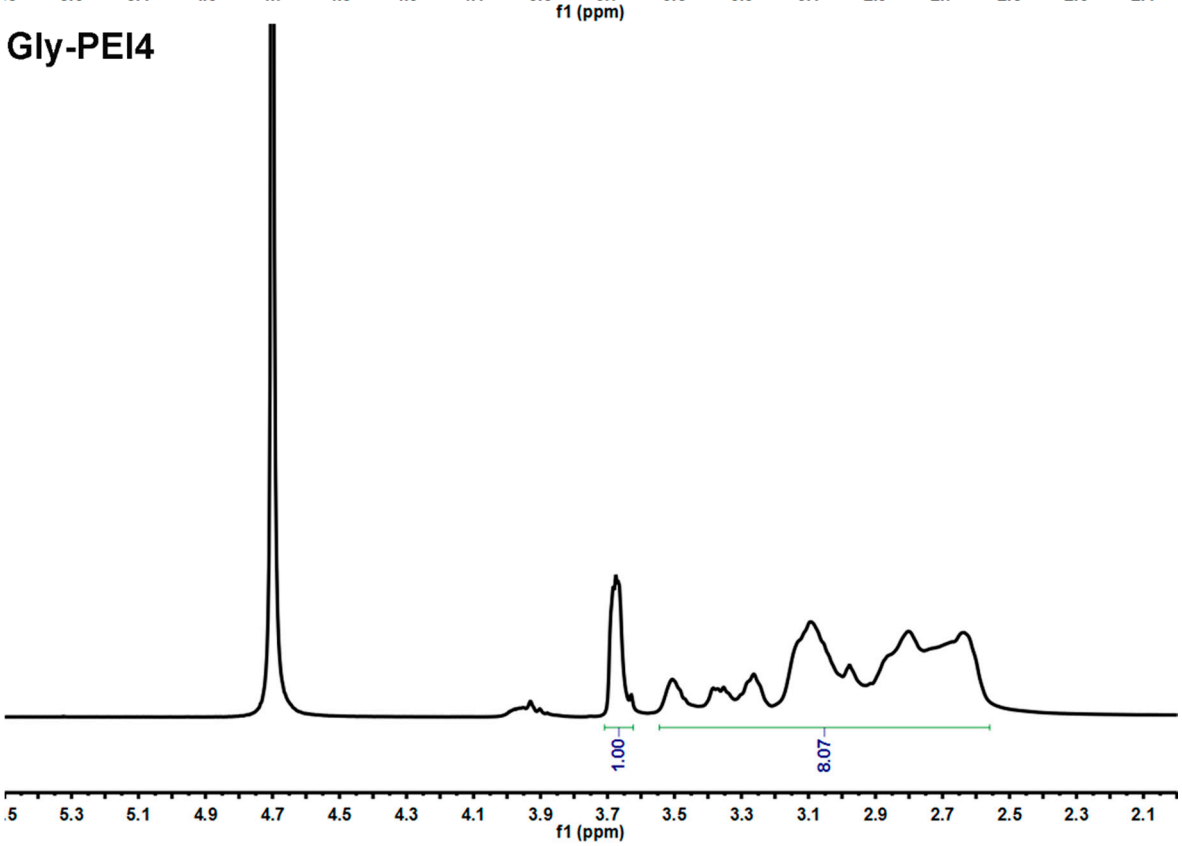
2.1
f1 (ppm)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5.1
4.9
4.7
4.5
4.3
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3.9
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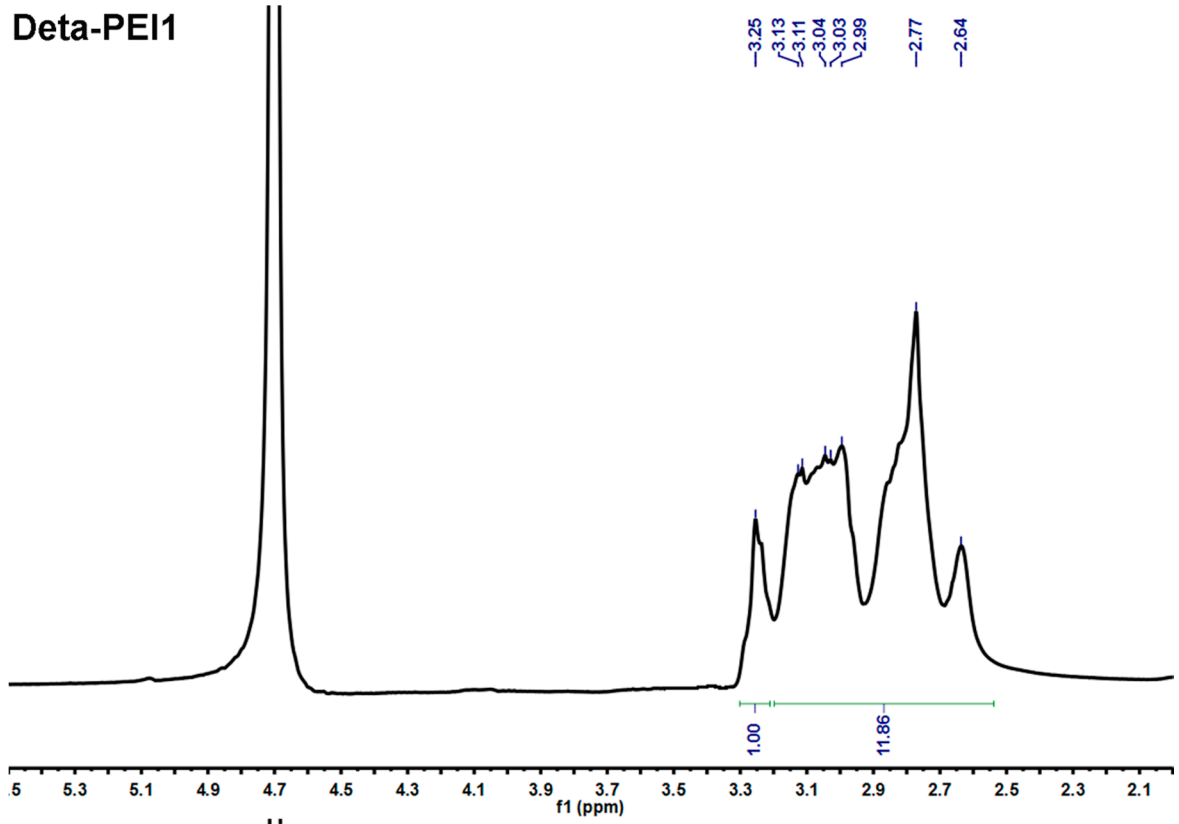
2.7
2.5
2.3
2.1
f1 (ppm)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3.13
3.11
3.04
3.03
2.99
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2.64
1.00
11.86
5.3
5.1
4.9
4.7
4.5
4.3
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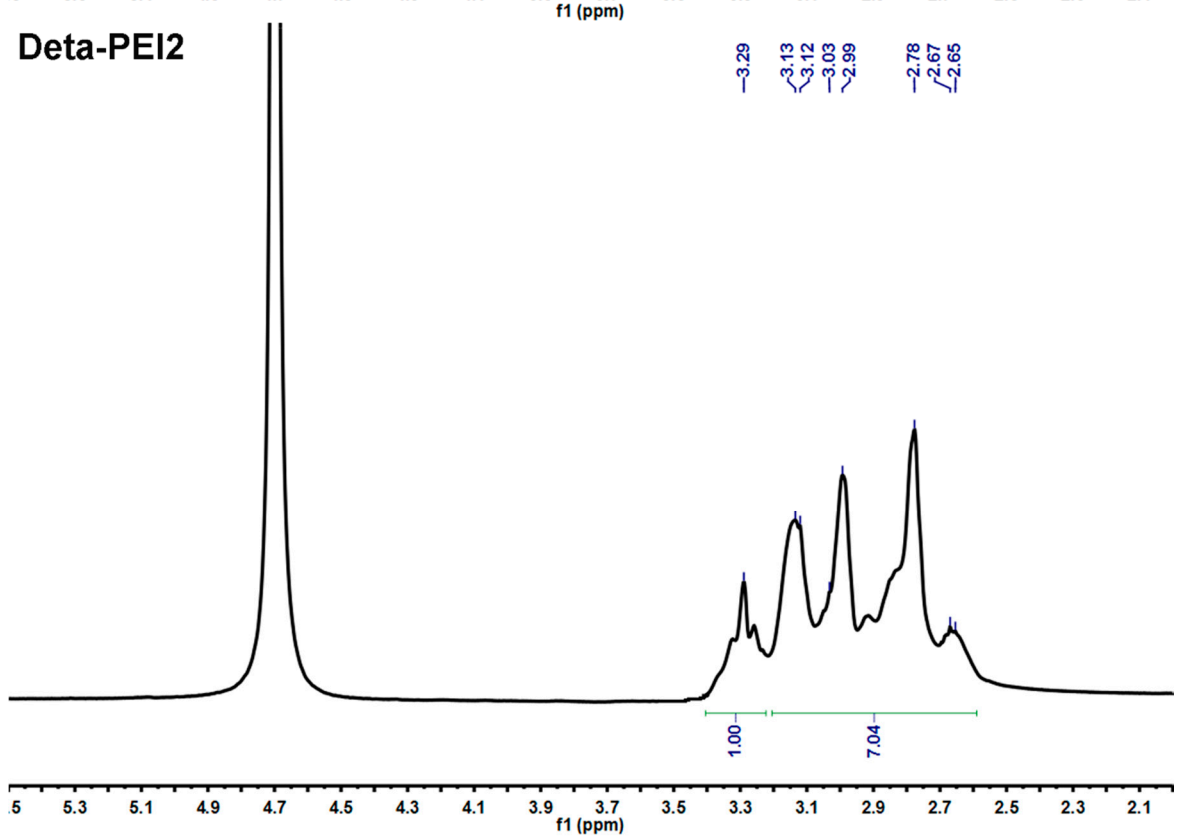
2.7
2.5
2.3
2.1
f1 (ppm)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5.3
5.1
4.9
4.7
4.5
4.3
4.1
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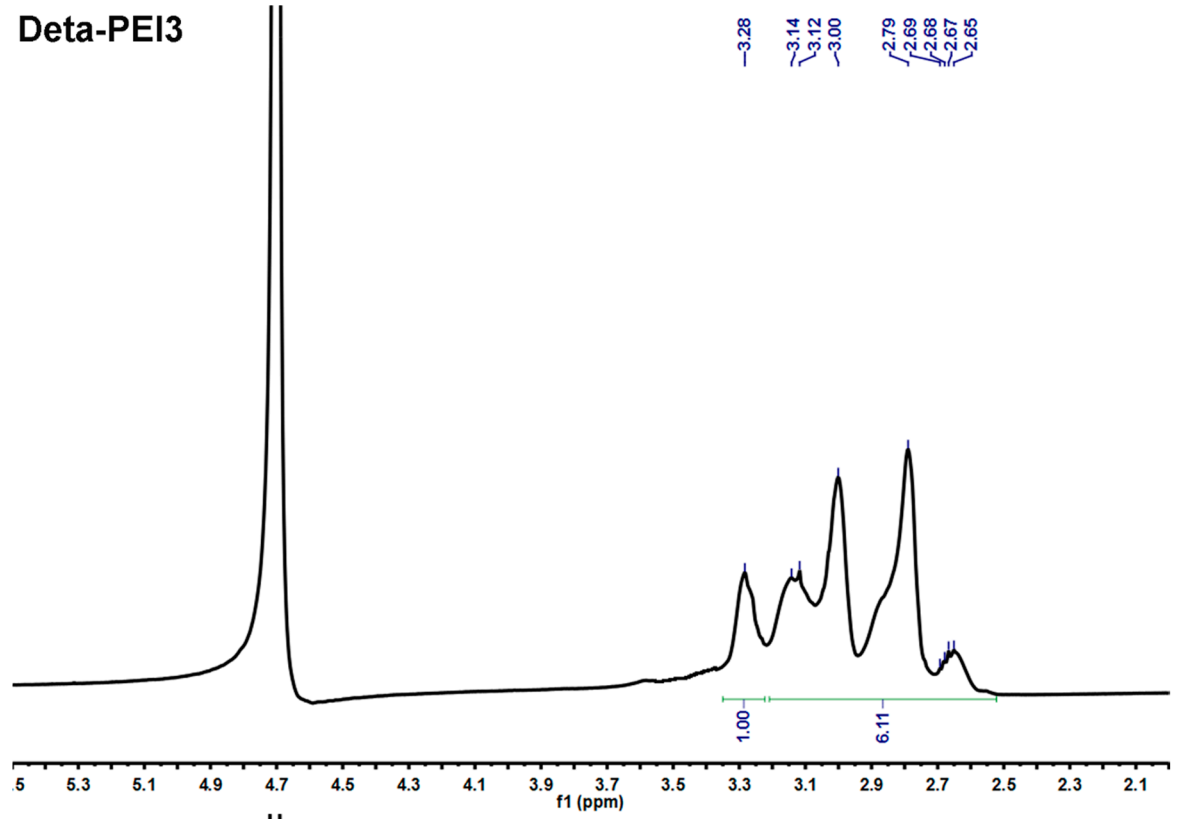
3.5
3.3
3.1
2.9
2.7
2.5
2.3
2.1
f1 (ppm)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1.00
6.11
5.3
5.1
4.9
4.7
4.5
4.3
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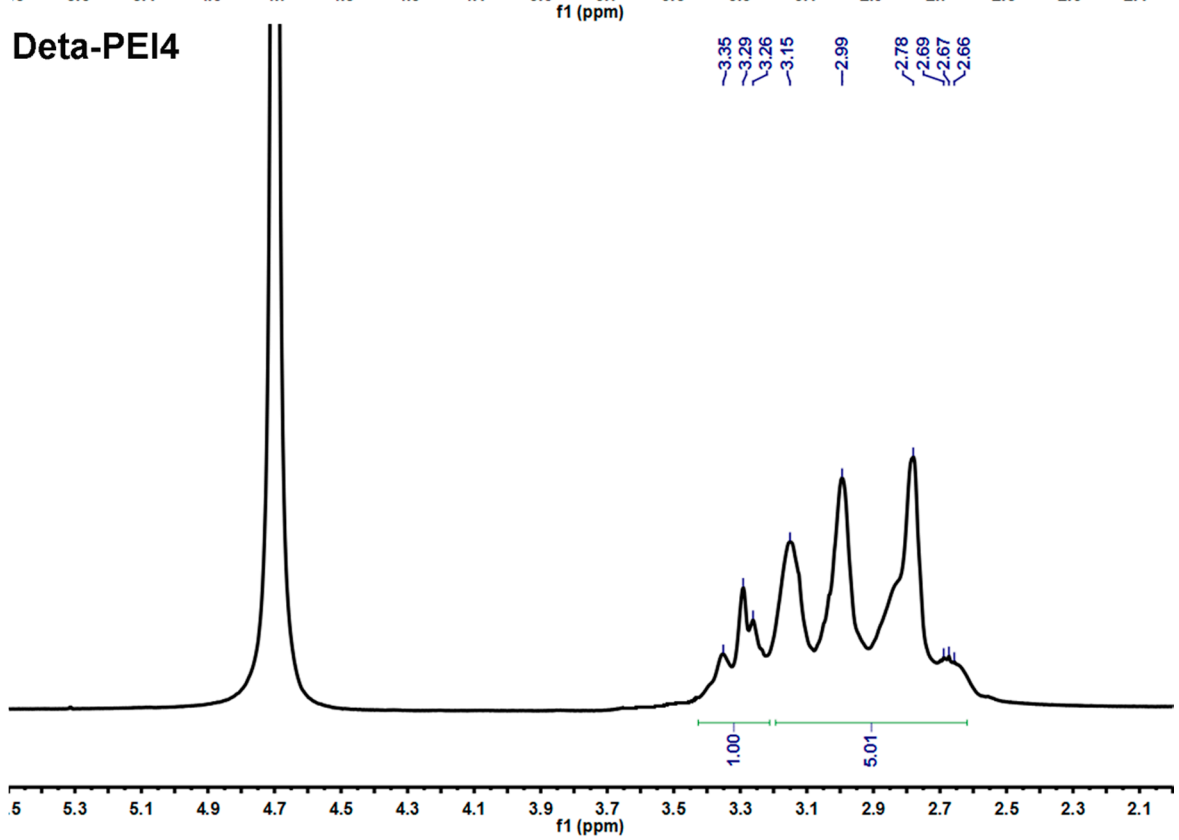
2.9
2.7
2.5
2.3
2.1
f1 (ppm)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5.3
5.1
4.9
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2.5
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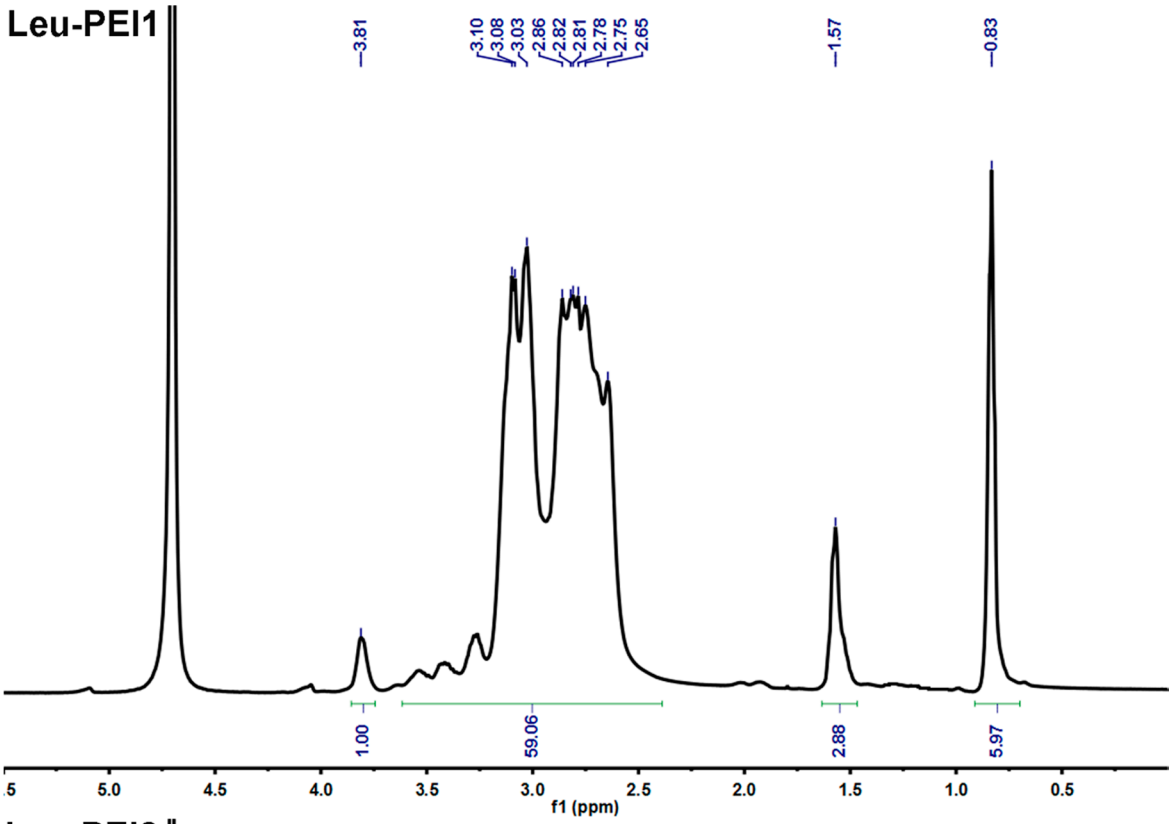
2.1
f1 (ppm)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3.10
3.08
3.03
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0.83
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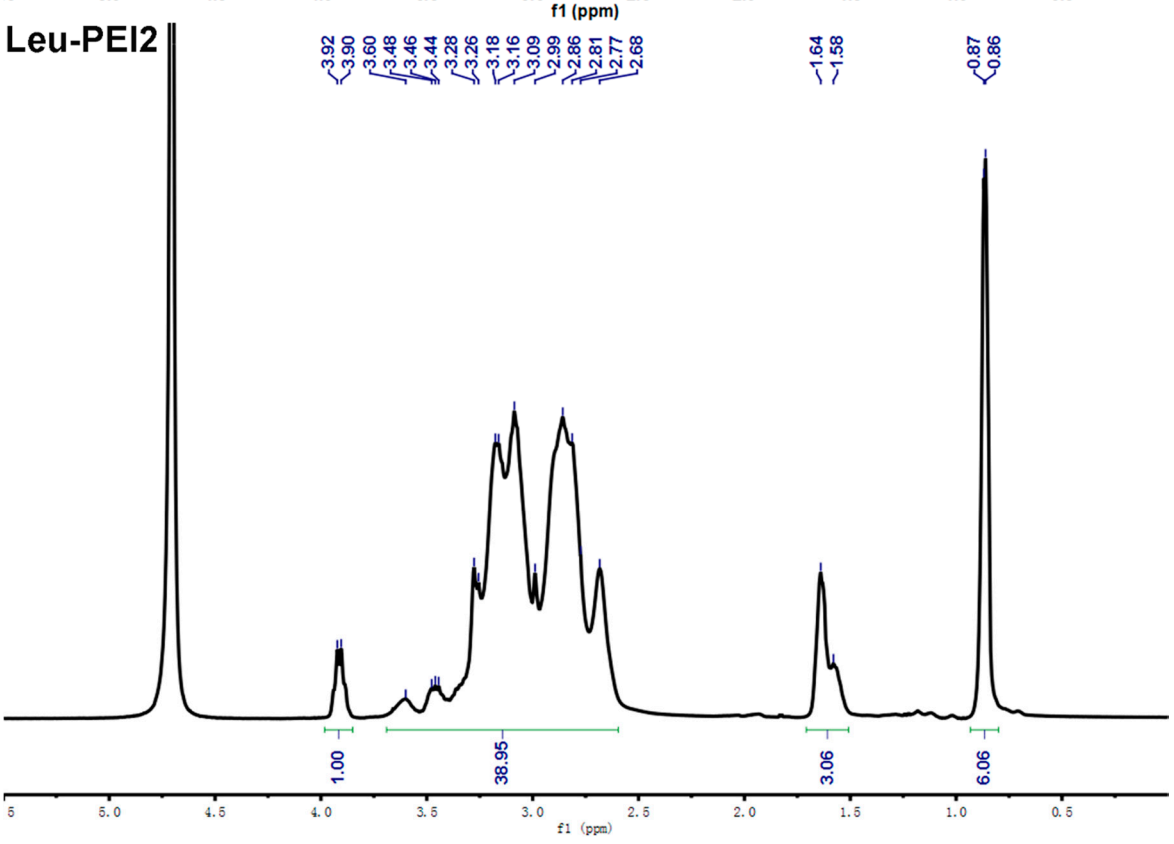
5.97
f1 (ppm)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3.09
2.99
2.86
2.81
2.77
2.68
1.64
1.58
0.87
0.86
1.00
38.95
3.06
6.06
f1 (ppm)