

Total norbornene incorporation in polymer was calculated using equation:

$$\text{Mol NB\%} = [1/3(2I_{C7} + I_{C1/C4} + I_{C2/C3})/I_{CH2}] \times 100\%$$

where: I_{CH2} , I_{C7} , $I_{C1/C4}$, $I_{C2/C3}$ are total area of the ^{13}C NMR signal at 26-30, 30-36, 36-42 and 43-52 ppm.

For example, total areas of the signal assigned to the selected carbon atoms for copolymer with 35.3 mol% NB incorporation (Table 1, item 20) were:

Carbon atoms	CH2	C7	C1/C4	C2/C3
Total area	3.18	0.71	0.95	1.00

For all the calculations, total area of the signal assigned to the C2/C3 carbon atoms was taken as unit value. Thus:

$$\text{Mol NB\%} = 1/3[2 \times 0.71 + 0.95 + 1]/3.18 \times 100\% = 35.3\%$$

Total 1-octene incorporation in polymer was calculated using total areas of the signal assigned to the selected carbon atoms according to equation:

$$\text{Mol Oct\%} = O' / (O' + E') \times 100\%$$

where: CH (br) branches $O1 = (A + 2C + 2D)/2$; α -carbons $O2 = [1.5A + 2B + (D + E) - D]/3$; average moles 1-octene $O' = (O1 + O2)/2$; moles ethylene $E' = \{[(F + G + H) - (3A + 3B + H + J + I)]/2\} + O'$,

where the regions of ^{13}C NMR signals are: A (40.8-39.8 ppm), B (39.8-38.8 ppm), C (38.8-36.3 ppm), D (34.0-33.8 ppm), D+E (36.1-32.5 ppm), F+G+H (32.5-24.8 ppm), H (27.8-25.8 ppm), I (24.3-23.3 ppm), and J (23.3-21.3 ppm).

For example, total areas of the signal assigned to the selected regions for copolymer with 6.9 mol% 1-octene incorporation (Table 2, item 8) were:

Region (ppm)	A (40.8-39.8)	B (39.8-38.8)	C (38.8-36.3)	D (34.0-33.8)	D+E (36.1-32.5)	F+G+H (32.5-24.8)	H (27.8-25.8)	I (24.3-23.3)	J (23.3-21.3)
Total area	0.41	0.30	1.27	2.08	4.19	65.00	2.92	0.48	1.00

For all the calculations, *J* area was taken as unit value. Thus:

$$O1 = (0.41 + 2 \times 1.27 + 2 \times 2.08) = 3.55$$

$$O2 = [1.5 \times 0.41 + 2 \times 0.30 + 4.19 - 2.08]/3 = 1.11$$

$$O' = (3.55 + 1.11)/2 = 2.33$$

$$E' = [65.00 - (3 \times 0.41 + 3 \times 0.30 + 2.92 + 0.48 + 1.00)]/2 + 2.33 = 31.57$$

Thus:

$$\text{Mol Oct\%} = 2.33 / (2.33 + 31.57) \times 100\% = 6.9\%$$

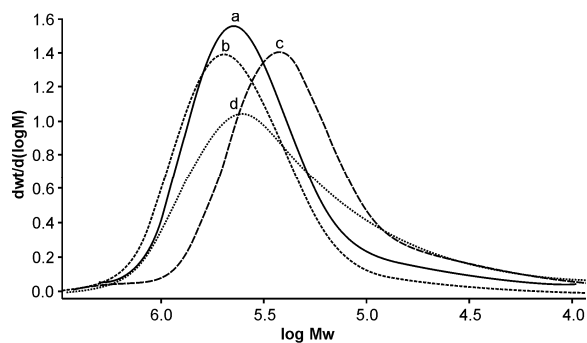
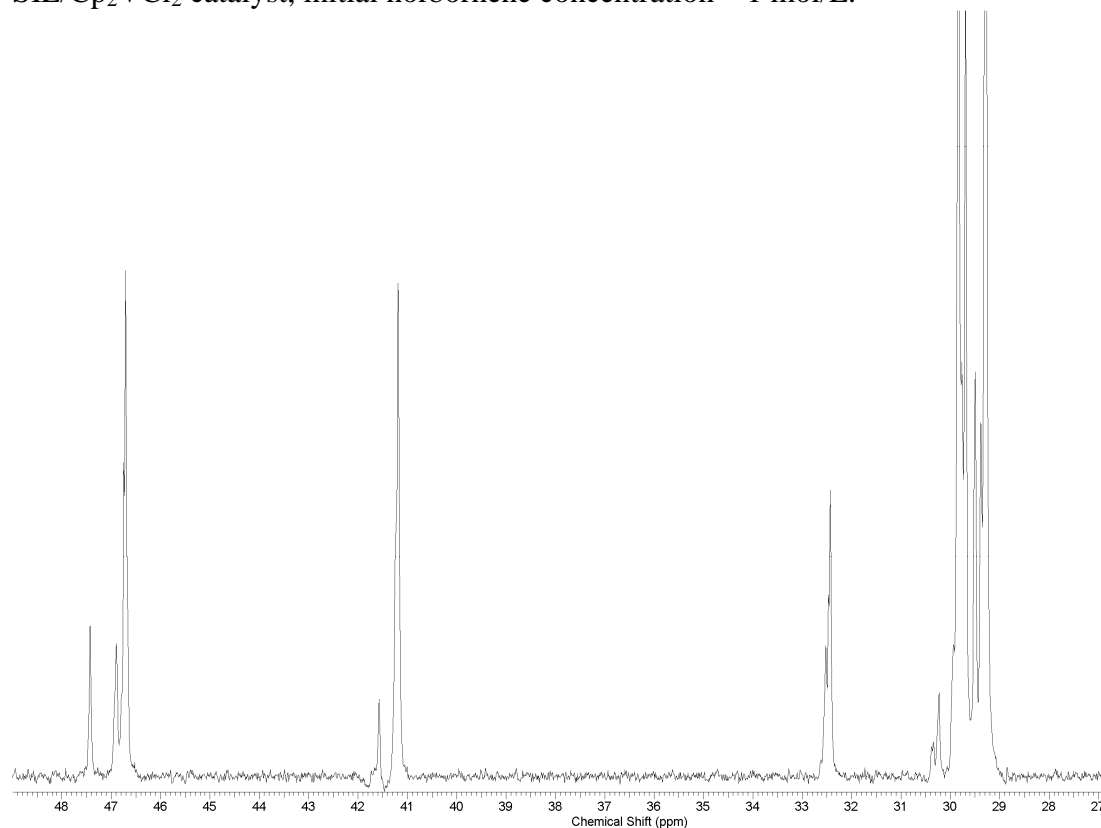
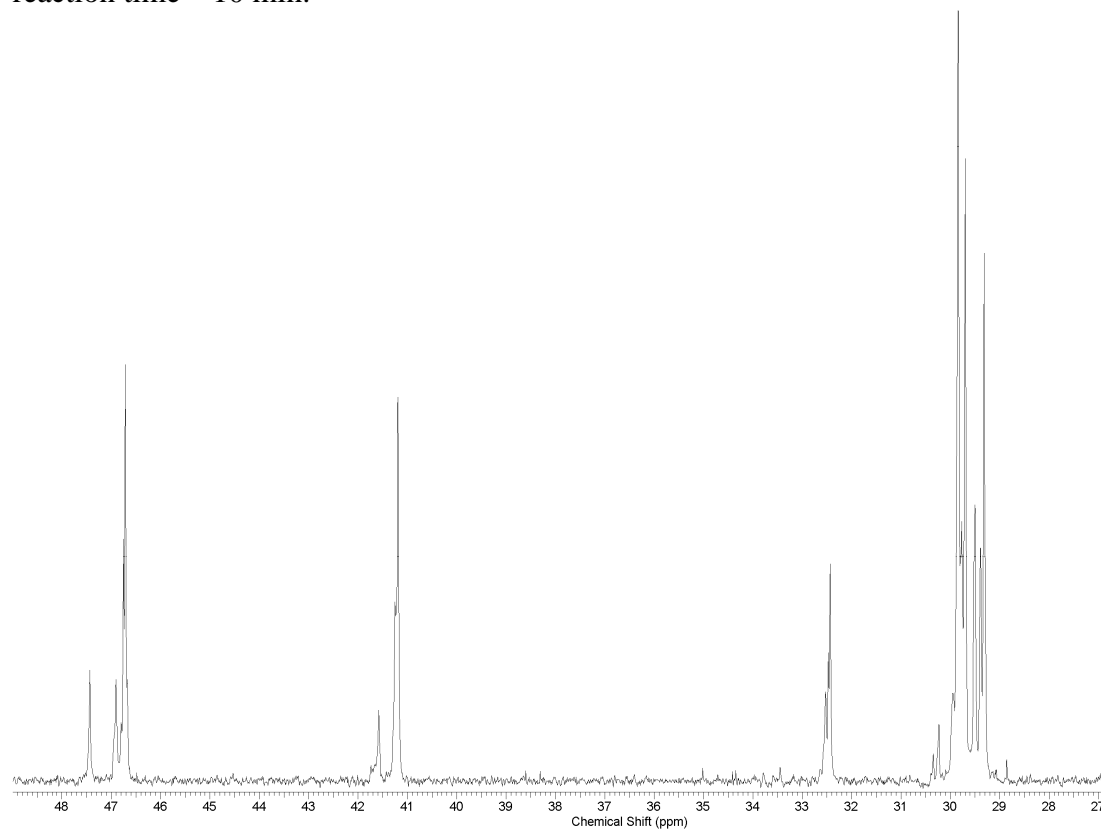


Fig 1S. GPC traces of the copolymer samples: a, b) ethylene/norbornene (Table 1, items 17, 18, NB incorporation 18.6, 24.3mol%); c, d) ethylene/1-octene (Table 2, items 5, 8, Oct. incorporation 4.9, 6.9mol%).

Fig. 2S ^{13}C NMR spectra of the ethylene/norbornene copolymer obtained using the SIL/ Cp_2VCl_2 catalyst, initial norbornene concentration – 1 mol/L.

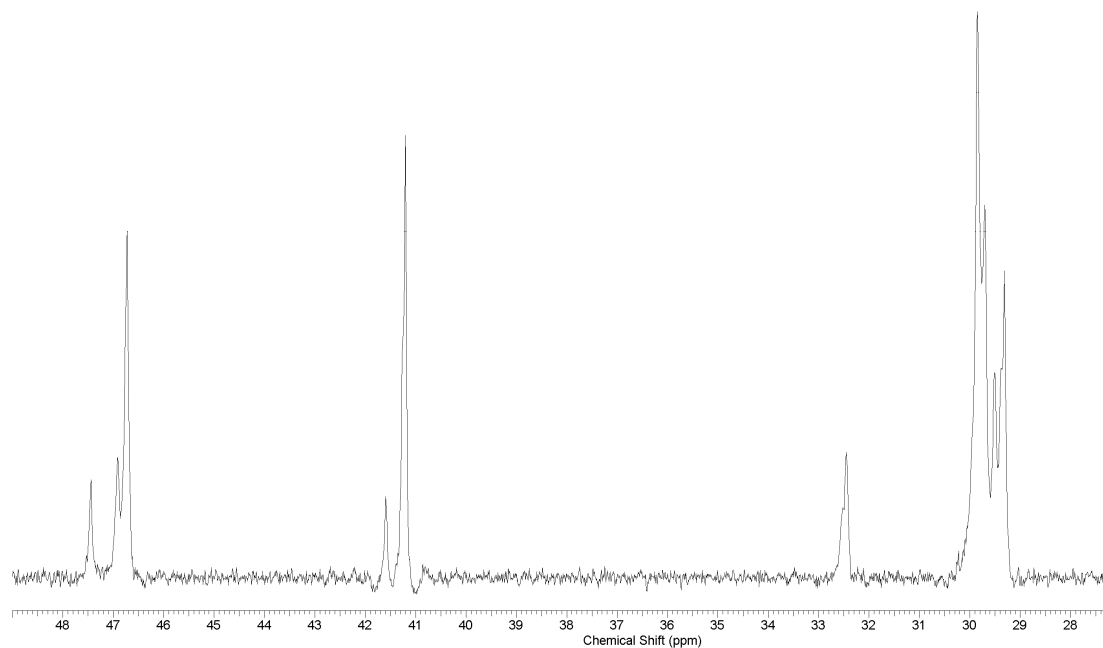


reaction time – 10 min.

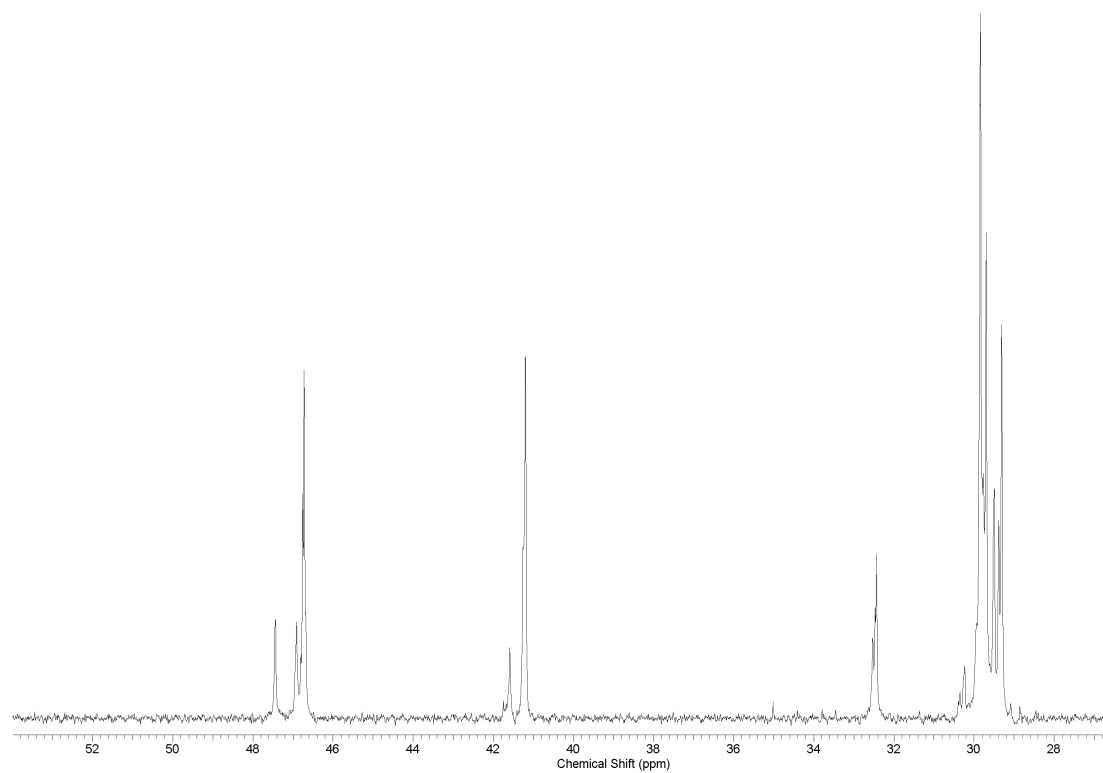


reaction time – 60 min.

Fig. 3S ^{13}C NMR spectra of the ethylene/norbornene copolymer obtained using the homogeneous Cp_2VCl_2 catalyst, initial norbornene concentration – 1 mol/L.

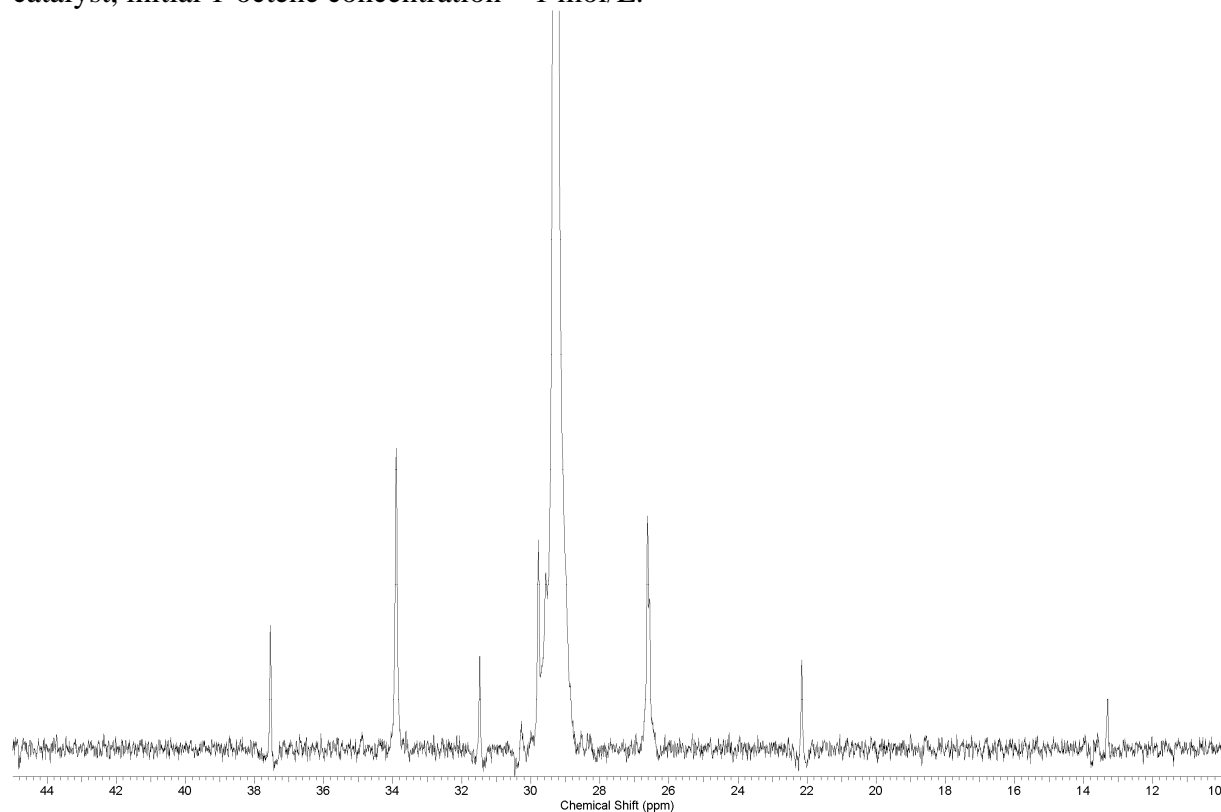


reaction time – 10 min.

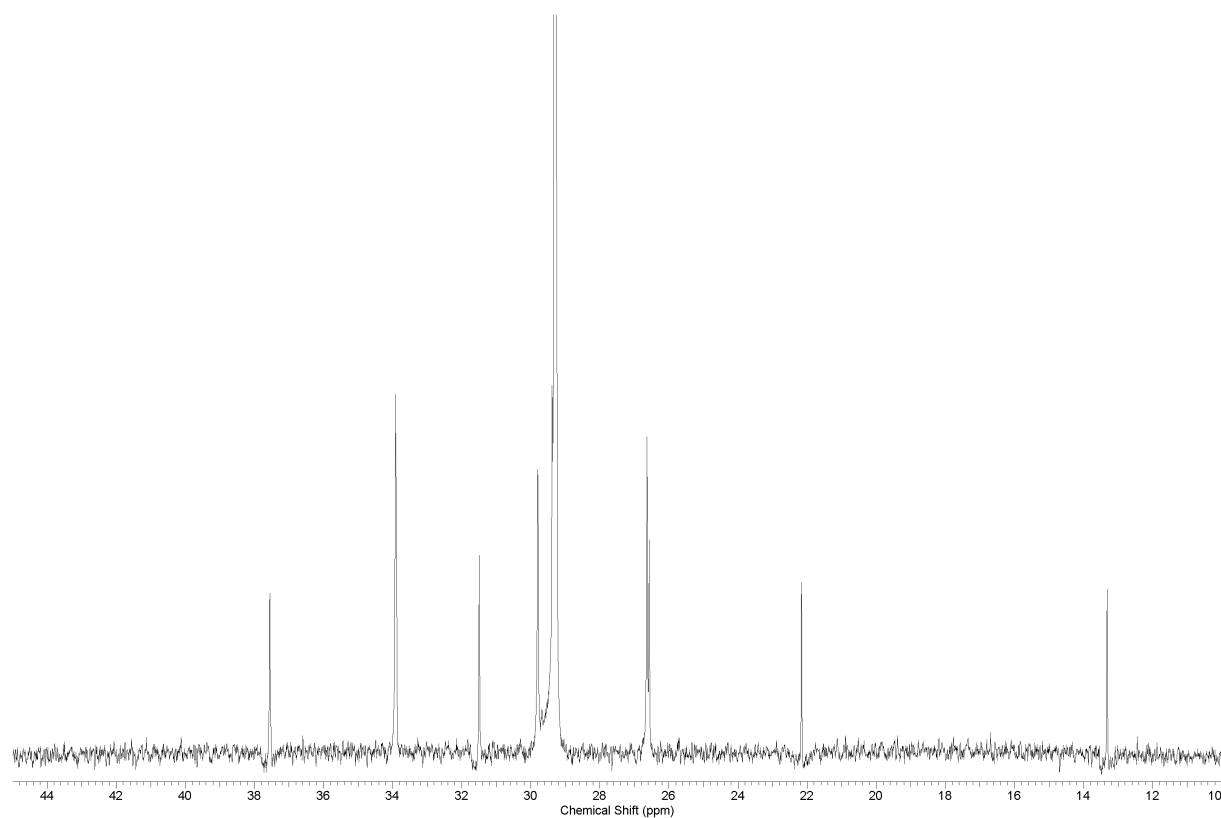


reaction time – 60 min.

Fig. 4S ^{13}C NMR spectra of the ethylene/1-octene copolymer obtained using the SIL/ Cp_2VCl_2 catalyst, initial 1-octene concentration – 1 mol/L.



reaction time – 10 min.



reaction time – 60 min.