# Supporting Information

## for

# Synthesis of modified cyclic and acyclic dextrins and comparison of their complexation ability

Kata Tuza[1*], László Jicsinszky[1,2], Tamás Sohajda[1], István Puskás[1] and Éva Fenyvesi[1]

Address: [1]CycloLab Cyclodextrin R&D Laboratory Ltd, Illatos út 7, Budapest, 1097, Hungary and [2]Dipartimento di Scienza e Tecnologia del Farmaco, Universitá di Torino, via P. Giuria 9, Turin, 10125, Italy

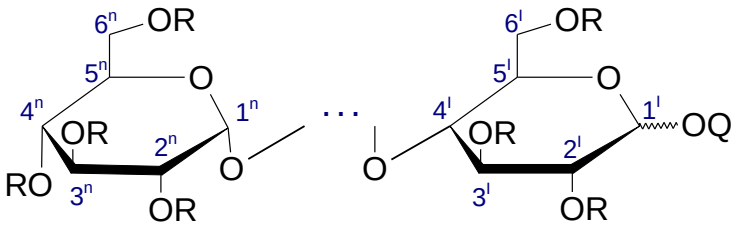
Email: Kata Tuza -tuza@cyclolab.hu

*Corresponding author

# Additional NMR and HPLC data

## Characterization of the ionic derivatives by NMR

All the NMR spectra including $^{1}H$, HSQC-DEPT (Heteronuclear Single Quantum Coherence - Distortionless Enhancement by Polarization Transfer) were recorded in $D_2O$ on a Varian VXR-300 instrument at 300 MHz.




Q = Bn or H

R = H or $CH_2CH(OH)CH_3$

n = 2-8

**Scheme S1:** General scheme of substituted maltooligomers for NMR assignment.

**Table S1:** Proton assignments of 1-*O*-benzylated and (2-hydroxy)propylated maltooligosaccharides (chemical shifts are in ppm).

| | **1-OBn** | | | **1-OH** | | |
|---|---|---|---|---|---|---|
| | **G6** | **G7** | **G8** | **G6** | **G7** | **G8** |
| Benzyl, Aromatic | 7.38-7.45, br m | 7.42-7.47, br, m | 7.40-7.60, br m | - | - | - |
| Benzyl, $CH_2\alpha$ | 4.93, d (J 11 Hz) | 4.93, d (J 12 Hz) | 4.93, d (J 12 Hz) | - | - | - |
| Benzyl, $CH_2\beta$ | 4.75, d (J 11 Hz) | 4.76, d (J 12 Hz) | 4.75, d (J 12Hz) | - | - | - |
| (2-Hydroxy)prop-yl $CH_2$ | - | - | - | 3.45-3.55, 3.63-68, 3.79-3.84, br | 3.43-3.53, 3.61-3.66, 3.76-3.82, br | 3.45-3.54, 3.62-3.66, 3.78-3.82, br |
| (2-Hydroxy)prop-yl CH | - | - | - | 3.92-4.04, br | 3.91-4.02, br | 3.89-4.02, br |
| (2-Hydroxy)prop-yl $CH_3$ | - | - | - | 1.14, 1.16, br | 1.13, 1.15, br | 1.13, 1.15, br |
| $H1^{I}\alpha$ | 5.38, br | 5.38, br | 5.39, br | 5.21, 5.52, br | 5.20, 5.51, br | 5.19, 5.50, br |
| $H1^{I}\beta$ | 4.52, d ($J_{1,2}$ 7.7 Hz) | 4.54, d ($J_{1,2}$ 8 Hz) | 4.53, d ($J_{1,2}$ 7.6 Hz) | 4.63, d ($J_{1,2}$ 7.6 Hz) | 4.62, d ($J_{1,2}$ 7.8 Hz) | 4.62, d ($J_{1,2}$ 7.4 Hz) |
| $H2^{I}$ | 3.55, br m | 3.55, br m | 3.55, br m | 3.55-3.72, br, unsubst 3.69, br, subst | 3.54-3.68, br, unsubst 3.67, br, subst | 3.54-3.68, br, unsubst 3.67, br, subst |
| $H3^{I}$ | 3.82, br m | 3.84, br m | 3.84, br m | 3.76-3.87, br, unsubst 3.71-3.78, br, subst | 3.75-3.85, br, unsubst 3.68-3.77, br, subst | 3.74-3.86, br, unsubst 3.69-3.76, br, subst |
| $H4^{I}$ | 3.64-3.76, br m | 3.58-3.74, br m | 3.57-3.75, br m | 3.44, br | 3.42, br | 3.43, br |
| $H5^{I}$ | 3.69-3.71, br m | 3.68-3.74, br m | 3.89-4.00, br m | 4.03, br | 4.01, br | 4.01, br |
| $H6^{I}$ | 3.73-3.94, br m | 3.75-3.96, br m | 3.70-3.95, br m | 3.74-3.93, br, unsubst 3.78-3.82, br, subst | 3.74-3.93, br, unsubst 3.78-3.82, br, subst | 3.74-3.93, br, unsubst 3.78-3.82, br, subst |
| $H1^{2-(n-1)}$ | 5.38, br d | 5.38, br | 5.39, br | 5.39, 5.67, br | 5.37, 5.65, br | 5.37, 5.65, br |
| $H2^{2-(n-1)}$ | 3.60-3.63, br m | 3.57-3.67, br m | 3.50-3.67, br m | 3.55-3.72, br, unsubst 3.69, br, subst | 3.54-3.68, br, unsubst 3.67, br, subst | 3.54-3.68, br, unsubst 3.67, br, subst |

| | 1-OBn | | | 1-OH | | |
|---|---|---|---|---|---|---|
| | **G6** | **G7** | **G8** | **G6** | **G7** | **G8** |
| $H3^{2-(n-1)}$ | 3.82, br m | 3.84, br m | 3.84, br m | 3.76-3.87, br, unsubst<br>3.71-3.78, br, subst | 3.75-3.85, br, unsubst<br>3.68-3.77, br, subst | 3.74-3.86, br, unsubst<br>3.69-3.76, br, subst |
| $H4^{2-(n-1)}$ | 3.64-3.76, br m | 3.58-3.74, br m | 3.57-3.75, br m | 3.44, br | 3.42, br | 3.43, br |
| $H5^{2-(n-1)}$ | 3.92-3.97, br m | 3.91-4.02, br m | 3.62-3.73, br m | 3.76-3.87, br, unsubst<br>3.71-3.78, br, subst | 3.75-3.85, br, unsubst<br>3.68-3.77, br, subst | 3.74-3.86, br, unsubst<br>3.69-3.76, br, subst |
| $H6^{2-(n-1)}$ | 3.73-3.94, br m | 3.75-3.96, br m | 3.70-3.95, br m | 3.74-3.93, br, unsubst<br>3.78-3.82, br, subst | 3.74-3.93, br, unsubst<br>3.78-3.82, br, subst | 3.74-3.93, br, unsubst<br>3.78-3.82, br, subst |
| $H1^{n}$ | 5.38, br d | 5.38, br | 5.39, br | 5.39, 5.67, br | 5.37, 5.65, br | 5.37, 5.65, br |
| $H2^{n}$ | 3.60-3.63, br m | 3.57-3.67, br m | 3.50-3.67, br m | 3.55-3.72, br, unsubst<br>3.69, br, subst | 3.54-3.68, br, unsubst<br>3.67, br, subst | 3.54-3.68, br, unsubst<br>3.67, br, subst |
| $H3^{n}$ | 3.82, br m | 3.84, br m | 3.84, br m | 3.76-3.87, br, unsubst<br>3.71-3.78, br, subst | 3.75-3.85, br, unsubst<br>3.68-3.77, br, subst | 3.74-3.86, br, unsubst<br>3.69-3.76, br, subst |
| $H4^{n}$ | 3.41, t ($J_{1,2}$ 9.1 Hz) | 3.39, t (overlapped) | 3.40, t (overlapped) | 3.44, br | 3.42, br | 3.42, br |
| $H5^{n}$ | 3.33, t ($J_{1,2}$ 8.7 Hz) | 3.35, t (overlapped) | 3.33, t (overlapped) | 3.27, br | 3.25, br | 3.25, br |
| $H6^{n}$ | 3.73-3.94, br m | 3.75-3.96, br m | 3.70-3.95, br m | 3.74-3.93, br, unsubst<br>3.78-3.82, br, subst | 3.74-3.93, br, unsubst<br>3.78-3.82, br, subst | 3.74-3.93, br, unsubst<br>3.78-3.82, br, subst |
| 1,2-Propylene-glycol $CH_2$ | - | - | - | - | 3.80, br | 3.81, br |
| 1,2-Propylene-glycol CH | - | - | - | - | 3.83, br | 3.84, br |
| 1,2-Propylene-glycol $CH_3$ | - | - | - | - | 1.13, 1.15, br | 1.13, 1.15, br |

**Table S2:** Carbon assignments of 1-*O*-benzylated and (2-hydroxy)propylated maltooligosaccharides (chemical shifts are in ppm, based on DEPT-ed-HSQC experiments).

| | **1-OBn** | | | **1-OH** | | |
|---|---|---|---|---|---|---|
| | **G6** | **G7** | **G8** | **G6** | **G7** | **G8** |
| Benzyl, Aromatic | 128.8, br | 128.9 | 128.8, br | - | - | - |
| Benzyl, $CH_2\alpha$ | 71.4, 71.7 | 71.6, 71.7 | 71.5, 71.7 | - | - | - |
| Benzyl, $CH_2\beta$ | 71.6 | 71.6 | 71.5, 71.7 | - | - | - |
| (2-Hydroxy)prop-yl $CH_2$ | - | - | - | 76.1, 76.3, 76.4 | 76.1, 76.2, 76.4 | 76.1, 76.3 |
| (2-Hydroxy)prop-yl CH | - | - | - | 72.6, 73.1 | 73.1, 73.2 | 72.7, 73.1 |
| (2-Hydroxy)prop-yl $CH_3$ | - | - | - | 18.2 | 18.2 | 18.2 |
| $C1^{I}\alpha$ | 99.8, br | 99.7, br | 99.6-99.7, br | 91.8, 98.4 | 91.7, 98.3 | 91.9, 98.3 |
| $C1^{I}\beta$ | 101.2 | 101.2 | 101.2 | 95.6 | 95.7 | 95.8 |
| $C2^{I}$ | 74.7 | 74.7 | 74.6 | 71.5, 72.8, unsubst<br>77.4, subst | 71.5, 72.6, unsubst<br>77.2, subst | 71.4, 72.6, unsubst<br>76.9, subst |
| $C3^{I}$ | 71.3 | 71.3 | 71.3 | 70.9 unsubst 74.7,<br>subst | 70.8 unsubst<br>74.8, subst | 70.7, 71.1 unsubst<br>74.7, subst |
| $C4^{I}$ | 76.3-77.1, br | 76.3-77.0, br | 76.4-77.0, br | 79.9 | 79.9 | 79.9 |
| $C5^{I}$ | 72.9 | 72.9 | 73.4 | 66.3 | 66.6 | 66.1 |
| $C6^{I}$ | 60.5-60.9, br | 60.5-60.9, br | 60.5-60.9, br | 60.4, 60.6, unsubst<br>69.3, subst | 60.5, unsubst<br>69.2, subst | 60.4, unsubst<br>69.3, subst |
| $C1^{2\text{-}(n\text{-}1)}$ | 99.8 | 99.7 | 99.6-99.7, br | 96.7, 99.6 | 96.7, 99.5 | 96.7, 99.6 |
| $C2^{2\text{-}(n\text{-}1)}$ | 71.6-71.7 | 71.6-71.7 | 71.6-71.7 | 71.5, 72.8, unsubst<br>77.4, subst | 71.5, 72.6, unsubst<br>77.2, subst | 71.4, 72.6, unsubst<br>76.9, subst |

| | 1-OBn | | | 1-OH | | |
|---|---|---|---|---|---|---|
| | **G6** | **G7** | **G8** | **G6** | **G7** | **G8** |
| $C3^{2-(n-1)}$ | 71.3 | 71.3 | 71.3 | 70.9 unsubst 74.7, subst | 70.8 unsubst 74.8, subst | 70.7, 71.1 unsubst 74.7, subst |
| $C4^{2-(n-1)}$ | 76.3-77.1, br | 76.3-77.0, br | 76.4-77.0, br | 79.9 | 79.9 | 79.9 |
| $C5^{2-(n-1)}$ | 73.4 | 73.5 | 73.0, 73.6 | 66.3 | 66.6 | 66.1 |
| $C6^{2-(n-1)}$ | 60.5-60.9, br | 60.5-60.9, br | 60.5-60.9, br | 60.4, 60.6, unsubst 69.3, subst | 60.5, unsubst 69.2, subst | 60.4, unsubst 69.3, subst |
| $C1^{n}$ | 99.8 | 99.7 | 99.6-99.7, br | 96.7, 99.6 | 96.7, 99.5 | 96.7, 99.6 |
| $C2^{n}$ | 71.6-71.7 | 71.6-71.7 | 71.6-71.7 | 71.5, 72.8, unsubst 77.4, subst | 71.5, 72.6, unsubst 77.2, subst | 71.4, 72.6, unsubst 76.9, subst |
| $C3^{n}$ | 71.3 | 71.3 | 71.3 | 70.9 unsubst 74.7, subst | 70.8 unsubst 74.8, subst | 70.7, 71.1 unsubst 74.7, subst |
| $C4^{n}$ | 69.4 | 69.4 | 69.4 | 69.4 | 69.3 | 69.2 |
| $C5^{n}$ | 73.1 | 73.1 | 73.1 | 73.9 | 74.3 | 73.9 |
| $C6^{n}$ | 60.5-60.9, br | 60.5-60.9, br | 60.5-60.9, br | 60.4, 60.6, unsubst 69.3, subst | 60.5, unsubst 69.2, subst | 60.4, unsubst 69.3, subst |
| 1,2-Propylene-glycol $CH_2$ | - | - | - | - | 64.5 | 65.6 |
| 1,2-Propylene-glycol CH | - | - | - | - | 64.7 | 65.6 |
| 1,2-Propylene-glycol $CH_3$ | - | - | - | - | 18.2 | 18.2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Acquisition Time (sec)** | 5.4657 | **Comment** | 1_O-benzil-maltohexaoz(D1-58-A), 1H, | | | **Date** | 01 Oct 2014 22:03:12 |
| **Date Stamp** | 01 Oct 2014 22:03:12 | | | **File Name** | E:\doc\!Torino\Kata_sb_cikk\corr\beilstein\410\fid | | |
| **Frequency (MHz)** | 300.13 | **Nucleus** | 1H | **Number of Transients** | 16 | **Origin** | spect |
| **Original Points Count** | 16384 | **Owner** | guest | **Points Count** | 65536 | **Pulse Sequence** | zg30 |
| **Receiver Gain** | 181.00 | **SW(cyclical) (Hz)** | 2997.60 | **Solvent** | DEUTERIUM OXIDE | | |
| **Spectrum Offset (Hz)** | 1217.0212 | **Spectrum Type** | STANDARD | **Sweep Width (Hz)** | 2997.56 | **Temperature (degree C)** | 27.100 |

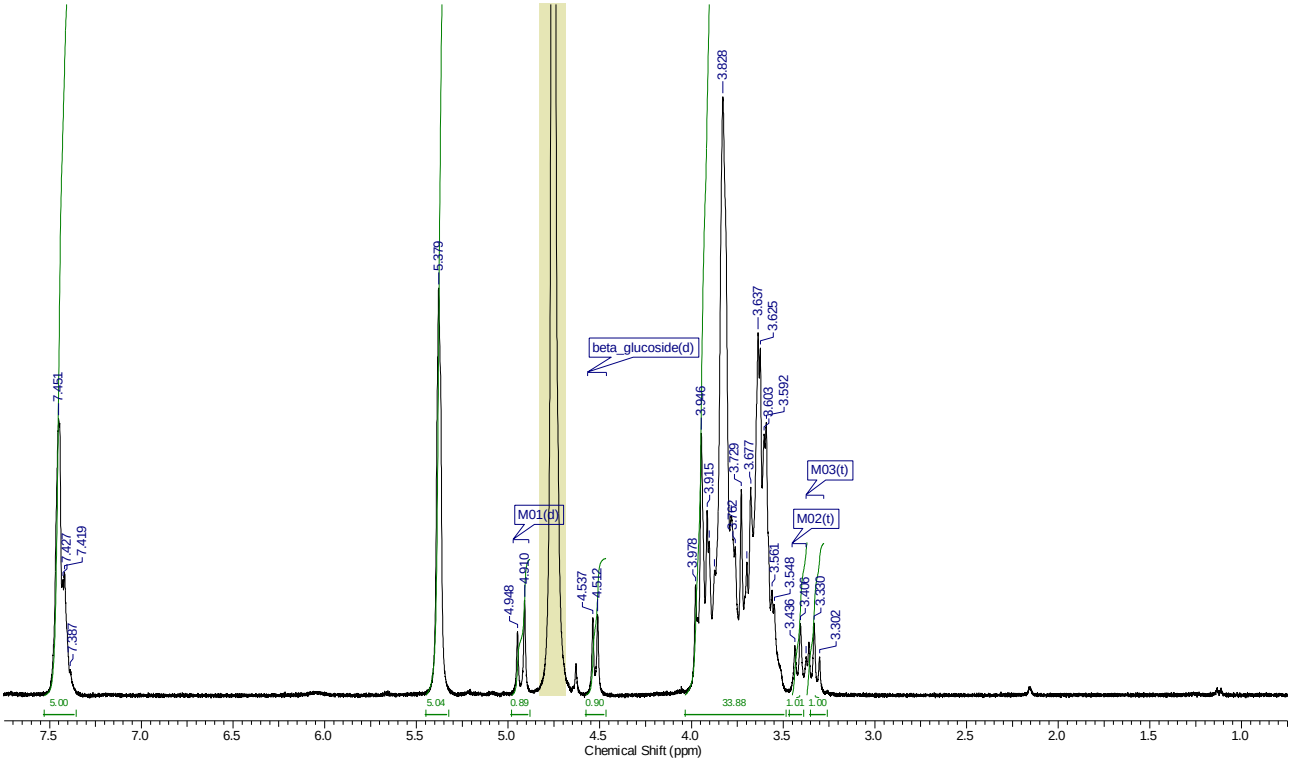



**Figure S1:** 300 MHz proton spectrum of 1-*O*-benzylmaltohexaose.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Acquisition Time (sec)** | (0.3211, 0.0205) | **Comment** | 5 mm QNP 1H/13C/31P/19F Z-GRD Z8352/0167 | | | **Date** | 09 Oct 2014 09:57:40 |
| **File Name** | E:\doc\!Torino\Kata_sb_cikk\corr\beilstein\412\ser | | | **Frequency (MHz)** | (300.13, 75.47) | **Nucleus** | (1H, 13C) |
| **Number of Transients** | 16 | **Origin** | spect | **Original Points Count** | (512, 256) | **Owner** | guest |
| **Points Count** | (1024, 1024) | **Pulse Sequence** | hsqcedetgp | **Solvent** | D2O | **Spectrum Type** | HSQC-DEPT |
| **Sweep Width (Hz)** | (1594.39, 12500.00) | **Temperature (degree C)** | 27.300 | **Title** | 1_O-benzil-maltohexaoz(D1-58-A), ed-gs-HSQC, | | |

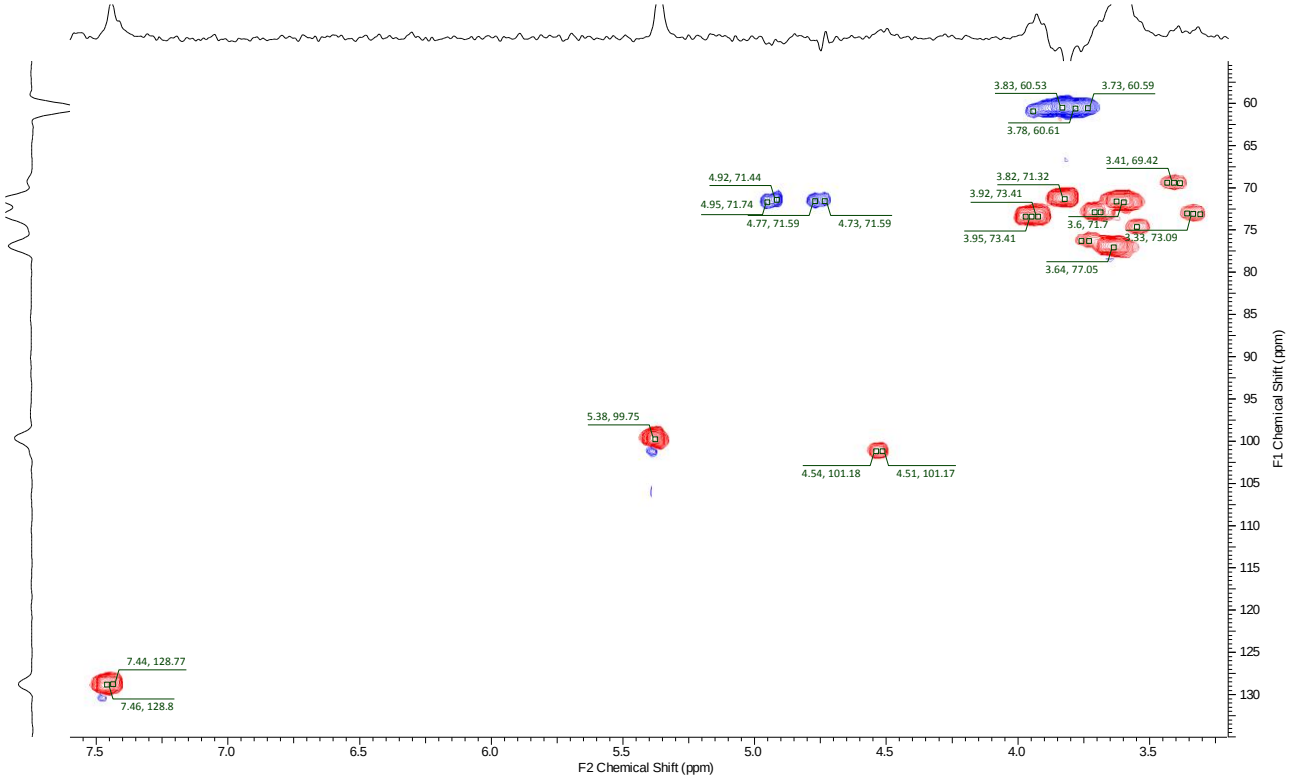



**Figure S2:** DEPT-ed-HSQC spectrum of 1-*O*-benzylmaltohexaose.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Acquisition Time (sec)*** | 5.4657 | ***Comment*** | 1_O-benzil-maltoheptaoz(D1-58-B), 1H, | | | ***Date*** | 02 Oct 2014 02:14:56 |
| ***Date Stamp*** | 02 Oct 2014 02:14:56 | | | ***File Name*** | E:\doc\!Torino\Kata_sb_cikk\corr\beilstein\430\fid | | |
| ***Frequency (MHz)*** | 300.13 | ***Nucleus*** | 1H | ***Number of Transients*** | 16 | ***Origin*** | spect |
| ***Original Points Count*** | 16384 | ***Owner*** | guest | ***Points Count*** | 65536 | ***Pulse Sequence*** | zg30 |
| ***Receiver Gain*** | 181.00 | ***SW(cyclical) (Hz)*** | 2997.60 | ***Solvent*** | DEUTERIUM OXIDE | | |
| ***Spectrum Offset (Hz)*** | 1216.0607 | ***Spectrum Type*** | STANDARD | ***Sweep Width (Hz)*** | 2997.56 | ***Temperature (degree C)*** | 27.400 |

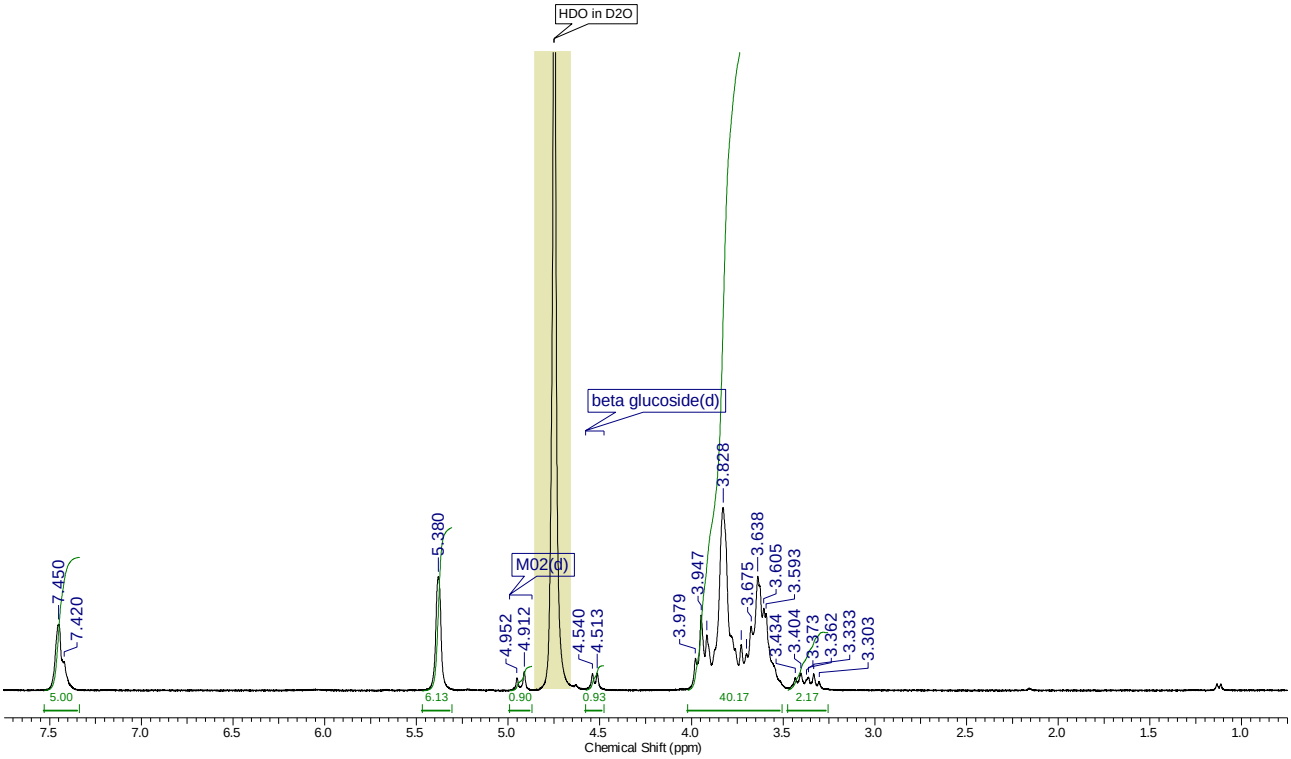



**Figure S3:** 300 MHz proton spectrum of 1-*O*-benzylmaltoheptaose.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Acquisition Time (sec)*** | (0.3244, 0.0205) | ***Comment*** | 5 mm QNP 1H/13C/31P/19F Z-GRD Z8352/0167 | | | ***Date*** | 09 Oct 2014 10:12:06 |
| ***File Name*** | E:\doc\!Torino\Kata_sb_cikk\corr\beilstein\432\ser | | | ***Frequency (MHz)*** | (300.13, 75.47) | ***Nucleus*** | (1H, 13C) |
| ***Number of Transients*** | 16 | ***Origin*** | spect | ***Original Points Count*** | (512, 256) | ***Owner*** | guest |
| ***Points Count*** | (1024, 1024) | ***Pulse Sequence*** | hsqcedetgp | ***Solvent*** | D2O | ***Spectrum Type*** | HSQC-DEPT |
| ***Sweep Width (Hz)*** | (1578.28, 12500.00) | ***Temperature (degree C)*** | 27.600 | ***Title*** | 1_O-benzil-maltoheptaoz(D1-58-B), 1H, | | |

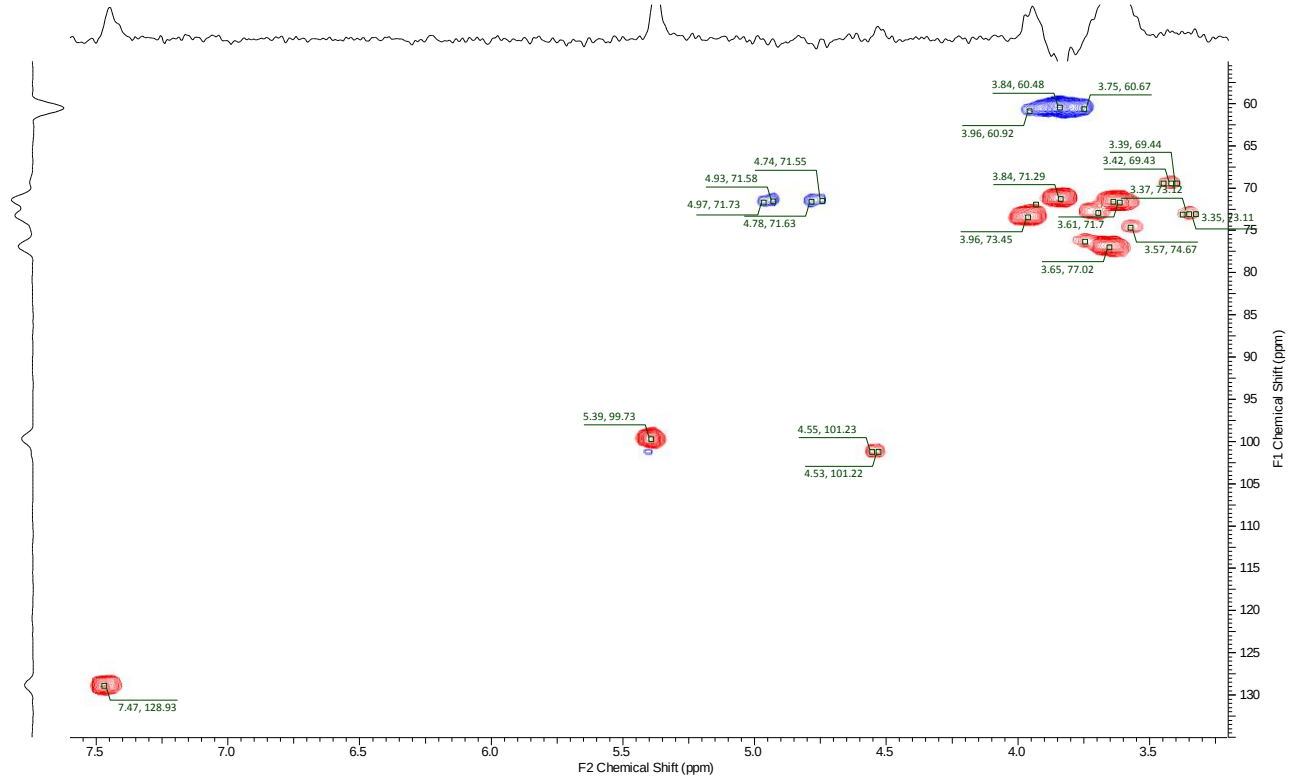



**Figure S4:** DEPT-ed-HSQC spectrum of 1-*O*-benzylmaltoheptaose.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Acquisition Time (sec)*** | 5.4657 | ***Comment*** | 1_O-benzil-maltooktaoz(D1-58-C), 1H, | | | ***Date*** | 02 Oct 2014 04:20:48 |
| ***Date Stamp*** | 02 Oct 2014 04:20:48 | | | ***File Name*** | E:\doc\!Torino\Kata_sb_cikk\corr\beilstein\440\fid | | |
| ***Frequency (MHz)*** | 300.13 | ***Nucleus*** | 1H | ***Number of Transients*** | 16 | ***Origin*** | spect |
| ***Original Points Count*** | 16384 | ***Owner*** | guest | ***Points Count*** | 65536 | ***Pulse Sequence*** | zg30 |
| ***Receiver Gain*** | 181.00 | ***SW(cyclical) (Hz)*** | 2997.60 | ***Solvent*** | DEUTERIUM OXIDE | | |
| ***Spectrum Offset (Hz)*** | 1216.7925 | ***Spectrum Type*** | STANDARD | ***Sweep Width (Hz)*** | 2997.56 | ***Temperature (degree C)*** | 27.500 |

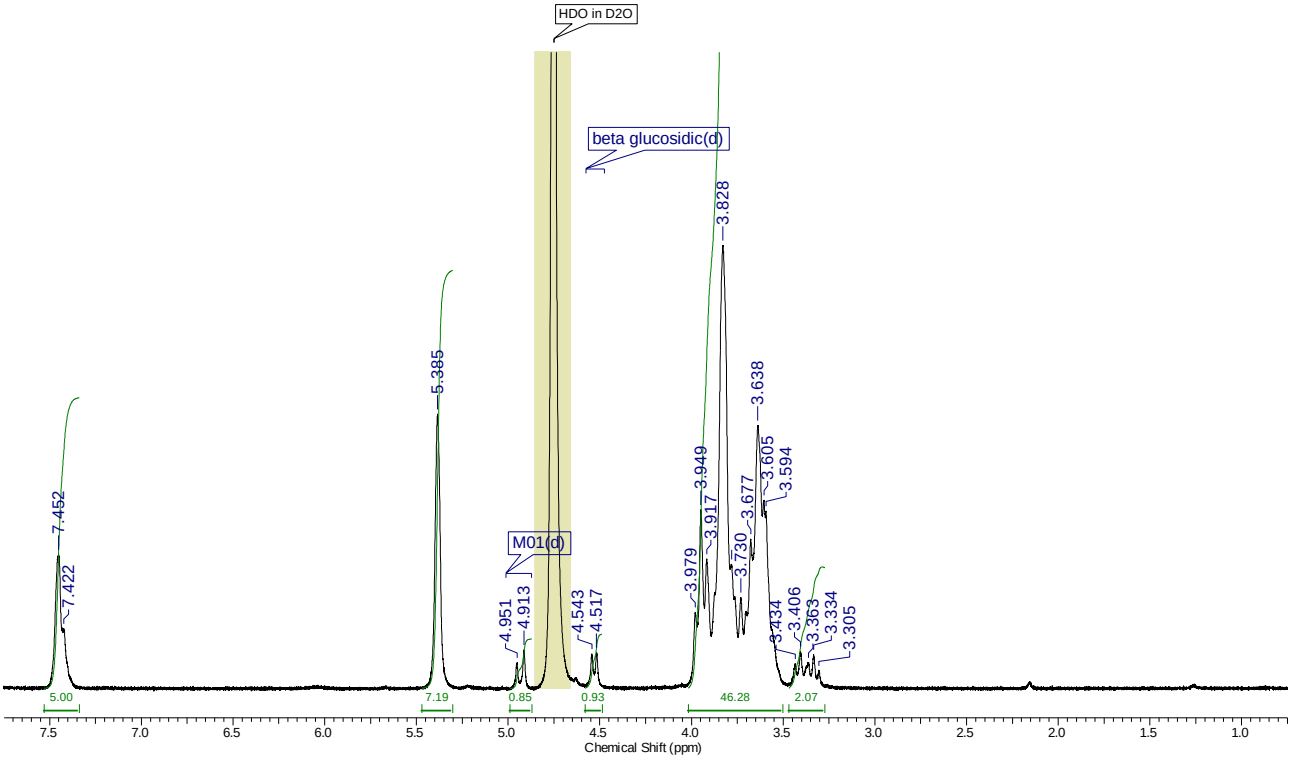



**Figure S5:** 300 MHz proton spectrum of 1-*O*-benzylmaltooctaose.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Acquisition Time (sec)*** | (0.3211, 0.0205) | ***Comment*** | 5 mm QNP 1H/13C/31P/19F Z-GRD Z8352/0167 | | | ***Date*** | 09 Oct 2014 09:57:40 |
| ***File Name*** | E:\doc\!Torino\Kata_sb_cikk\corr\beilstein\412\ser | | | ***Frequency (MHz)*** | (300.13, 75.47) | ***Nucleus*** | (1H, 13C) |
| ***Number of Transients*** | 16 | ***Origin*** | spect | ***Original Points Count*** | (512, 256) | ***Owner*** | guest |
| ***Points Count*** | (1024, 1024) | ***Pulse Sequence*** | hsqcedetgp | ***Solvent*** | D2O | ***Spectrum Type*** | HSQC-DEPT |
| ***Sweep Width (Hz)*** | (1594.39, 12500.00) | ***Temperature (degree C)*** | 27.300 | ***Title*** | 1_O-benzil-maltohexaoz(D1-58-A), ed-gs-HSQC, | | |

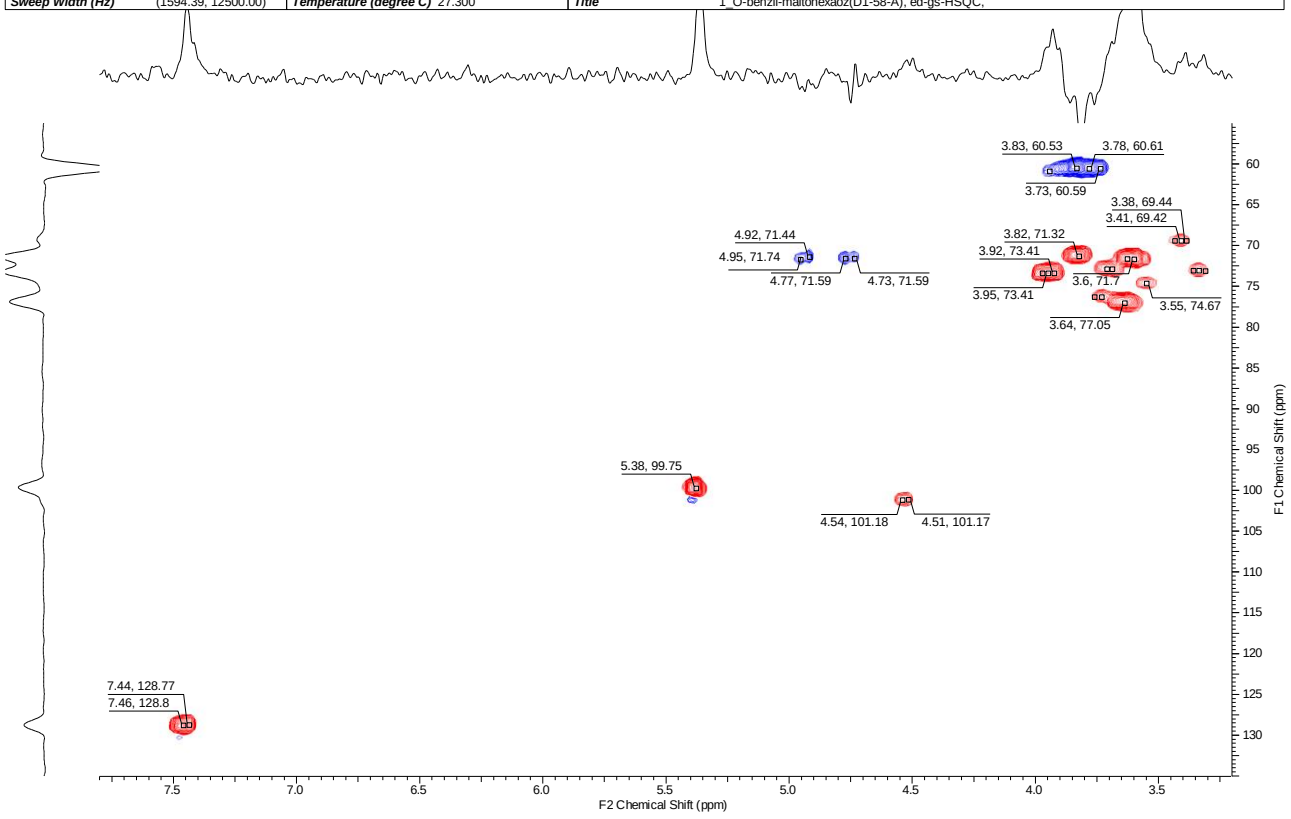



**Figure S6:** DEPT-ed-HSQC spectrum of 1-*O*-benzylmaltooctaose.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Acquisition Time (sec)*** | 5.4657 | ***Comment*** | (2hidroxi)propil-maltohexaoz(D1-68-A), 1H, | | | ***Date*** | 02 Oct 2014 00:09:04 | | |
| ***Date Stamp*** | 02 Oct 2014 00:09:04 | | | ***File Name*** | E:\doc\!Torino\Kata_sb_cikk\corr\beilstein\420\fid | | | ***Frequency (MHz)*** | 300.13 |
| ***Nucleus*** | 1H | ***Number of Transients*** | 16 | ***Origin*** | spect | ***Original Points Count*** | 16384 | ***Owner*** | guest |
| ***Points Count*** | 65536 | ***Pulse Sequence*** | zg30 | ***Receiver Gain*** | 181.00 | ***SW(cyclical) (Hz)*** | 2997.60 | ***Solvent*** | DEUTERIUM OXIDE |
| ***Spectrum Offset (Hz)*** | 1217.0212 | ***Spectrum Type*** | STANDARD | ***Sweep Width (Hz)*** | 2997.56 | ***Temperature (degree C)*** | 27.600 | | |

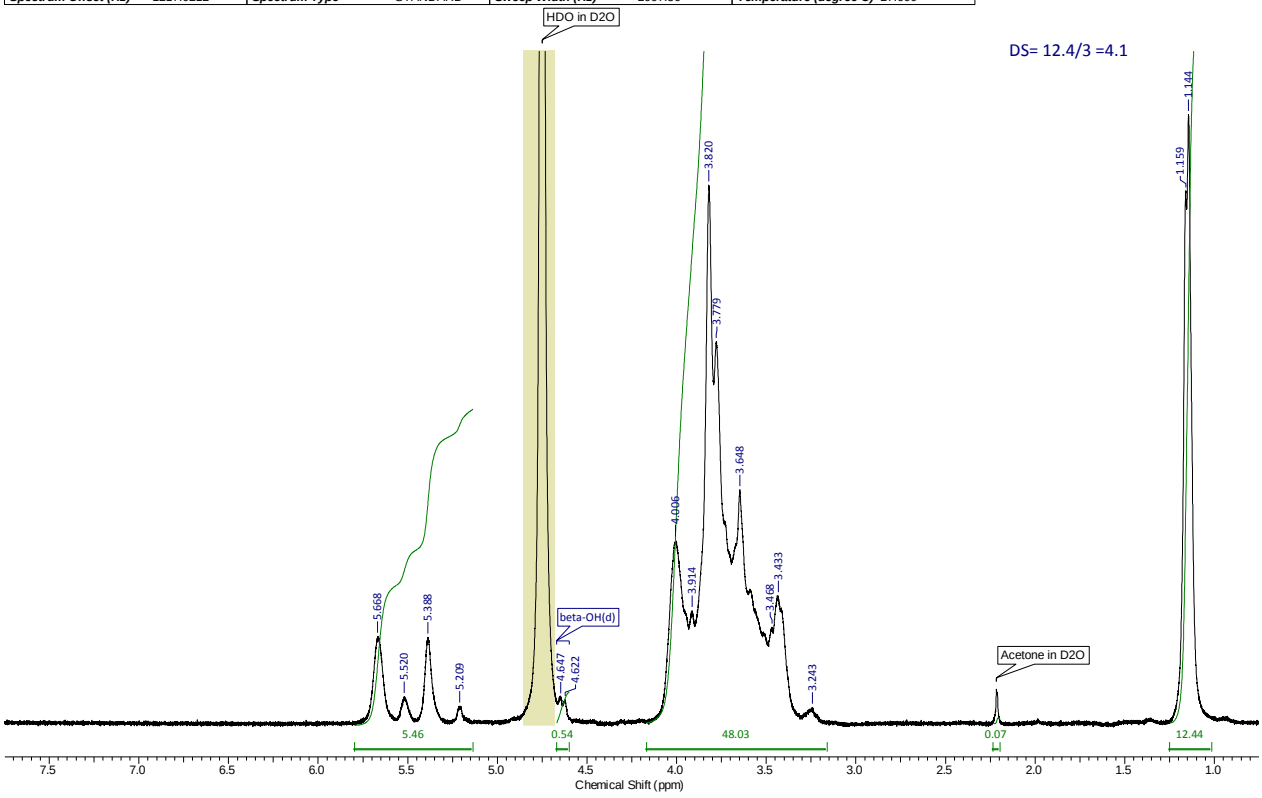



**Figure S7:** 300 MHz proton spectrum of (2-hydroxy)propylated maltohexaose.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Acquisition Time (sec)*** | (0.2851, 0.0205) | ***Comment*** | 5 mm QNP 1H/13C/31P/19F Z-GRD Z8352/0167 | | | ***Date*** | 09 Oct 2014 10:37:24 |
| ***File Name*** | E:\doc\!Torino\Kata_sb_cikk\corr\beilstein\422\ser | | | ***Frequency (MHz)*** | (300.13, 75.47) | ***Nucleus*** | (1H, 13C) |
| ***Number of Transients*** | 16 | ***Origin*** | spect | ***Original Points Count*** | (512, 256) | ***Owner*** | guest |
| ***Points Count*** | (2048, 1024) | ***Pulse Sequence*** | hsqcedetgp | ***Solvent*** | D2O | ***Spectrum Type*** | HSQC-DEPT |
| ***Sweep Width (Hz)*** | (1795.98, 12500.00) | ***Temperature (degree C)*** | 27.600 | ***Title*** | (2hidroxi)propil-maltohexaoz(D1-68-A), gs-HSQC, | | |

***AutoPhase*** Ambiguous Phase

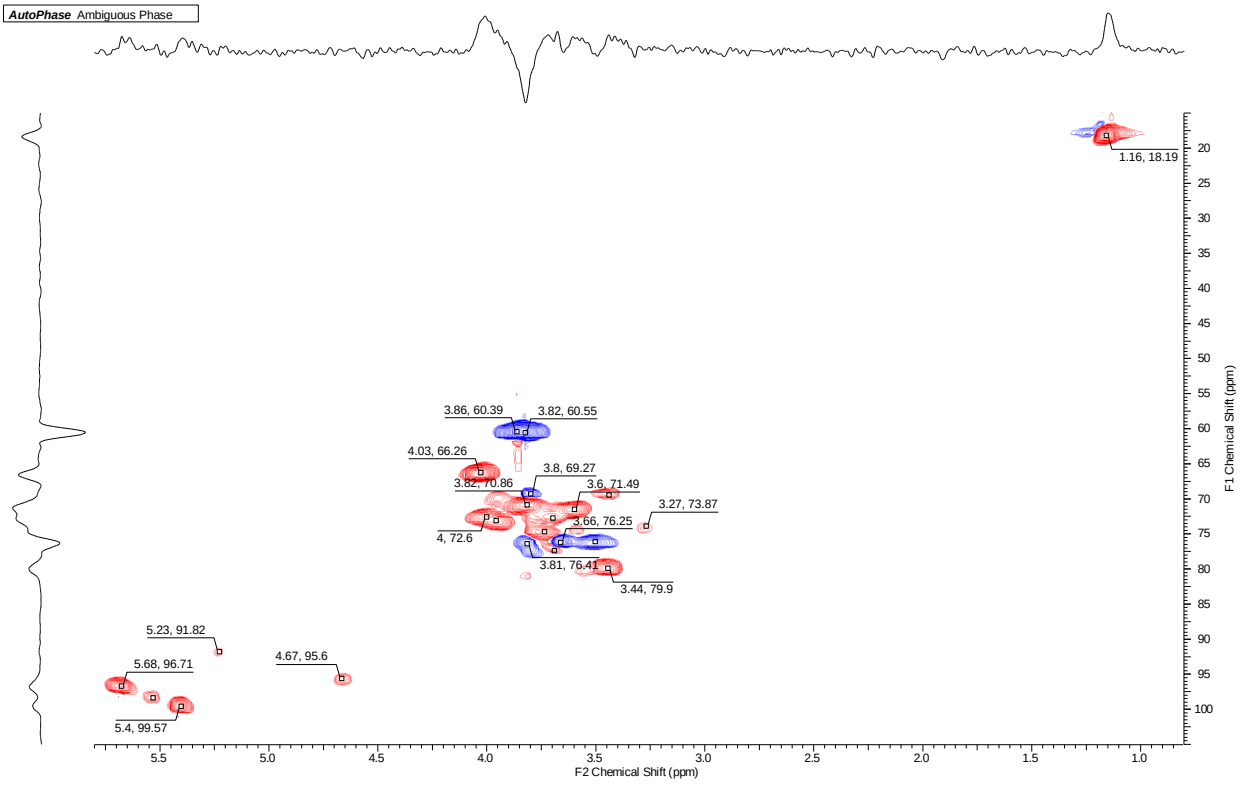



**Figure S8:** DEPT-ed-HSQC spectrum of (2-hydroxy)propylated maltohexaose.

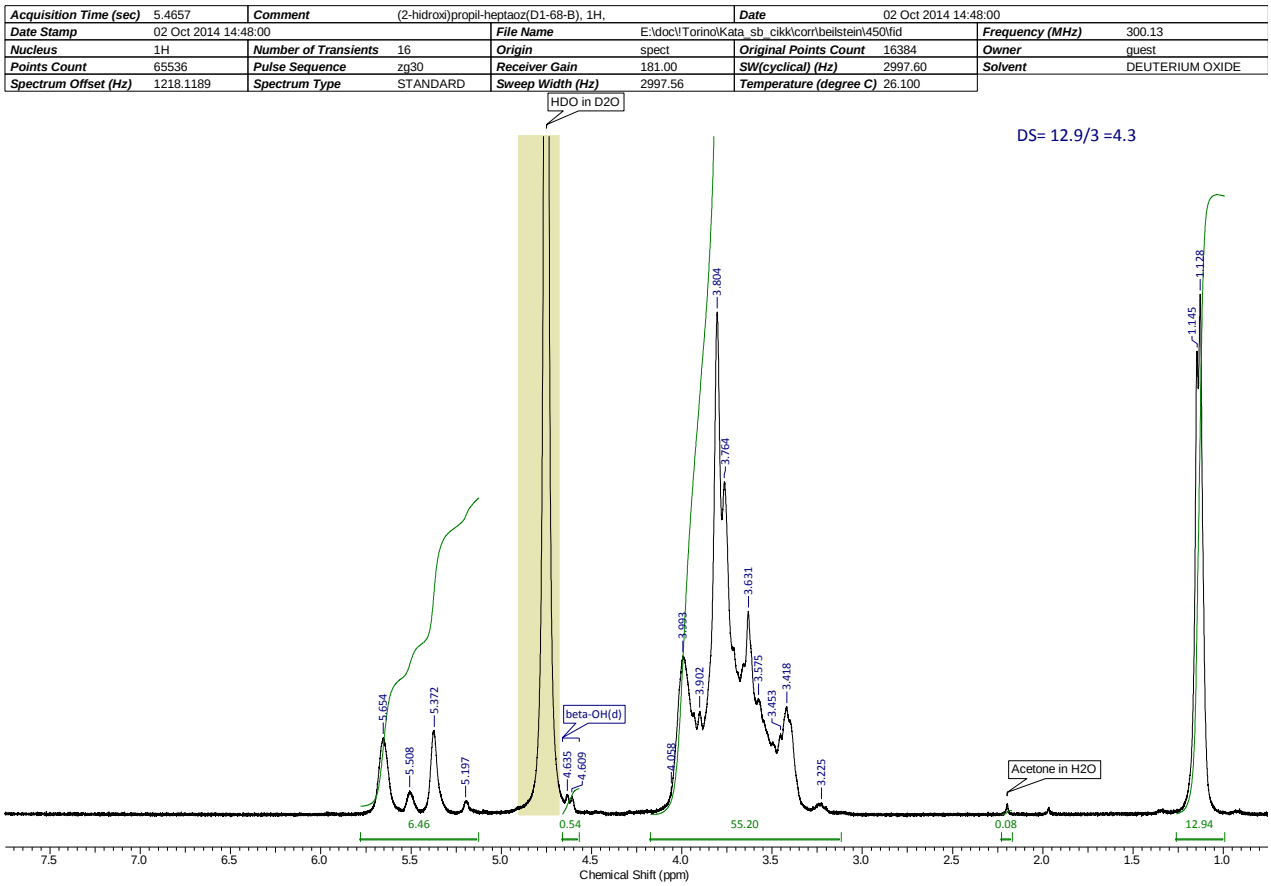



**Figure S9:** 300 MHz proton spectrum of (2-hydroxy)propylated maltoheptaose.

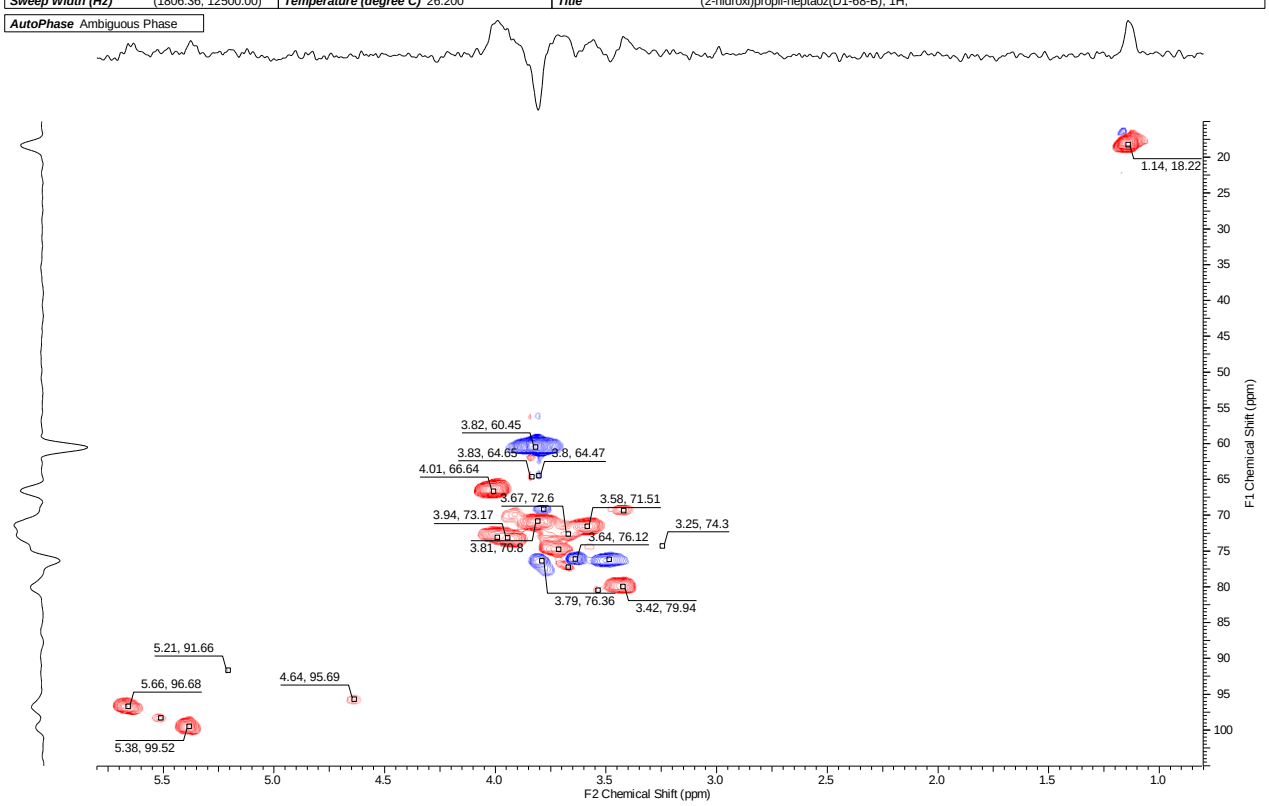



**Figure S10:** DEPT-ed-HSQC spectrum of (2-hydroxy)propylated maltoheptaose.

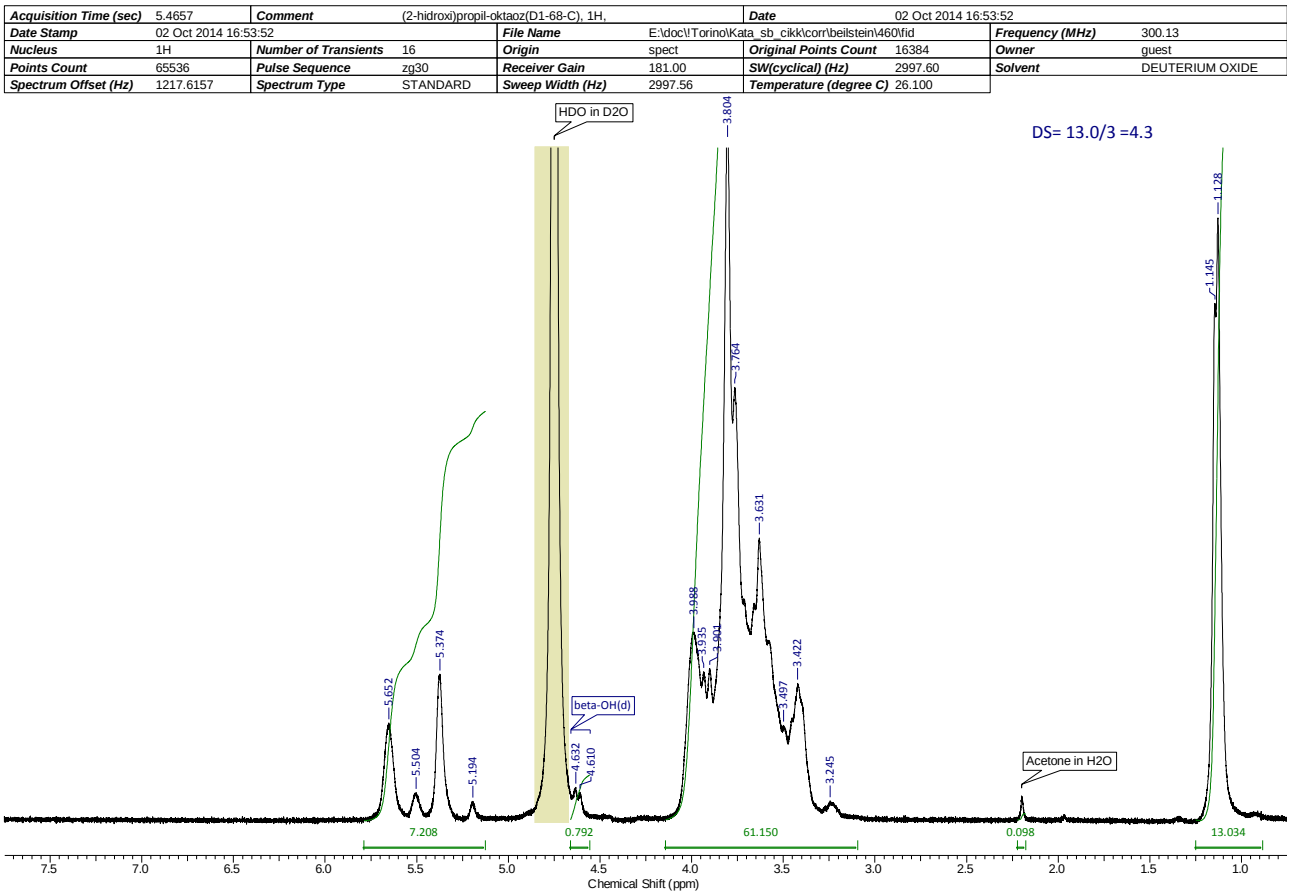



**Figure S11:** 300 MHz proton spectrum of (2-hydroxy)propylated maltooctaose.

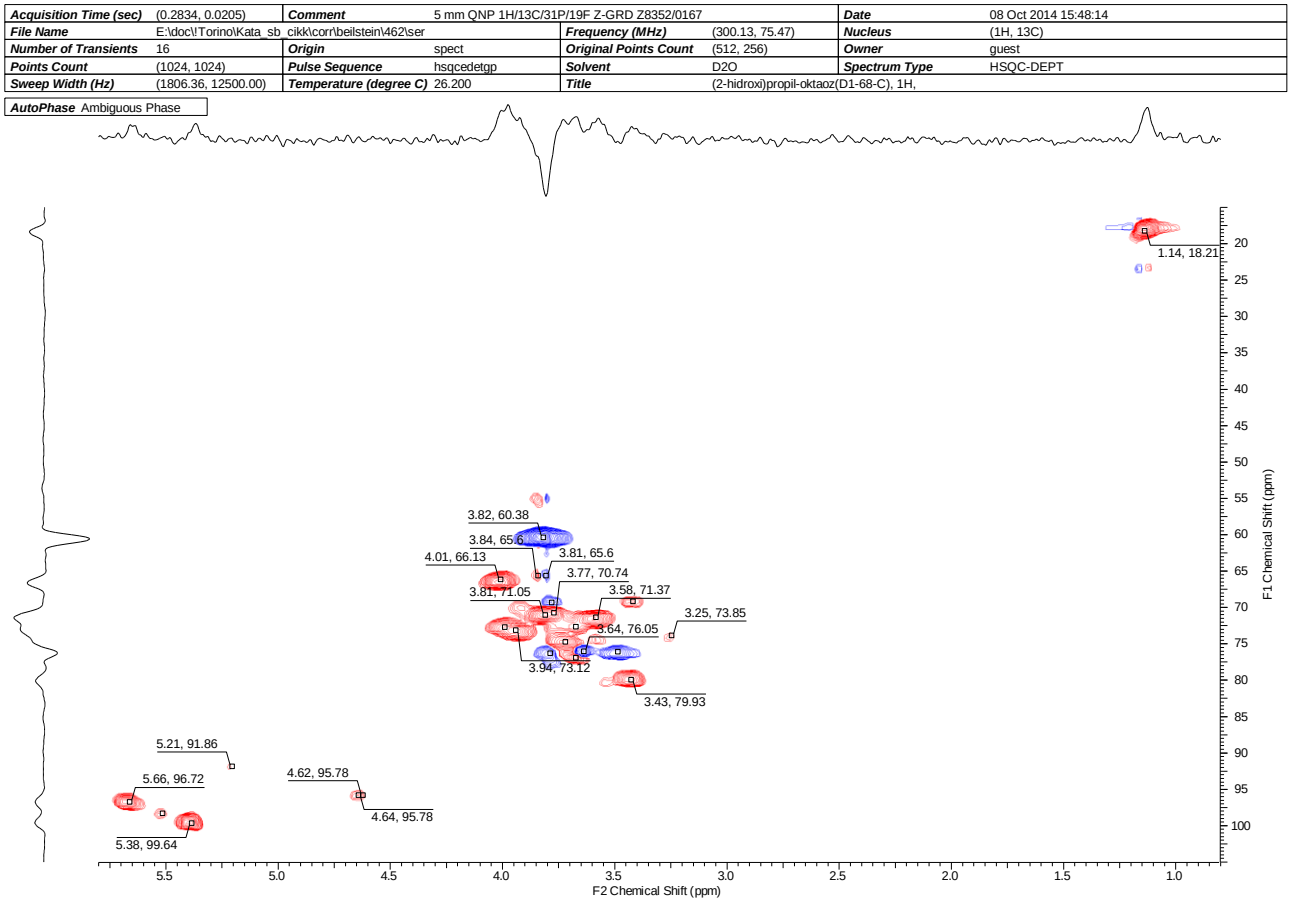



**Figure S12:** DEPT-ed-HSQC spectrum of (2-hydroxy)propylated maltooctaose.

## Characterization of the benzylated maltooligomers with HPLC

Agilent HPLC measuring system with Refractive Index Detector and/or DAD detector was used.
The used HPLC column was Inertsil HILIC, 150 × 4.6 mm, particle size 5 µm (GL Sciences Inc.)
The most appropriate mobile phase contained acetonitrile:water = 69:31.
The flow rate was 1.0 mL/min. The column temperature was set to 30 °C; the injection volume from the sample solution (concentration: 2 mg/mL mobile phase) was 100 µL.

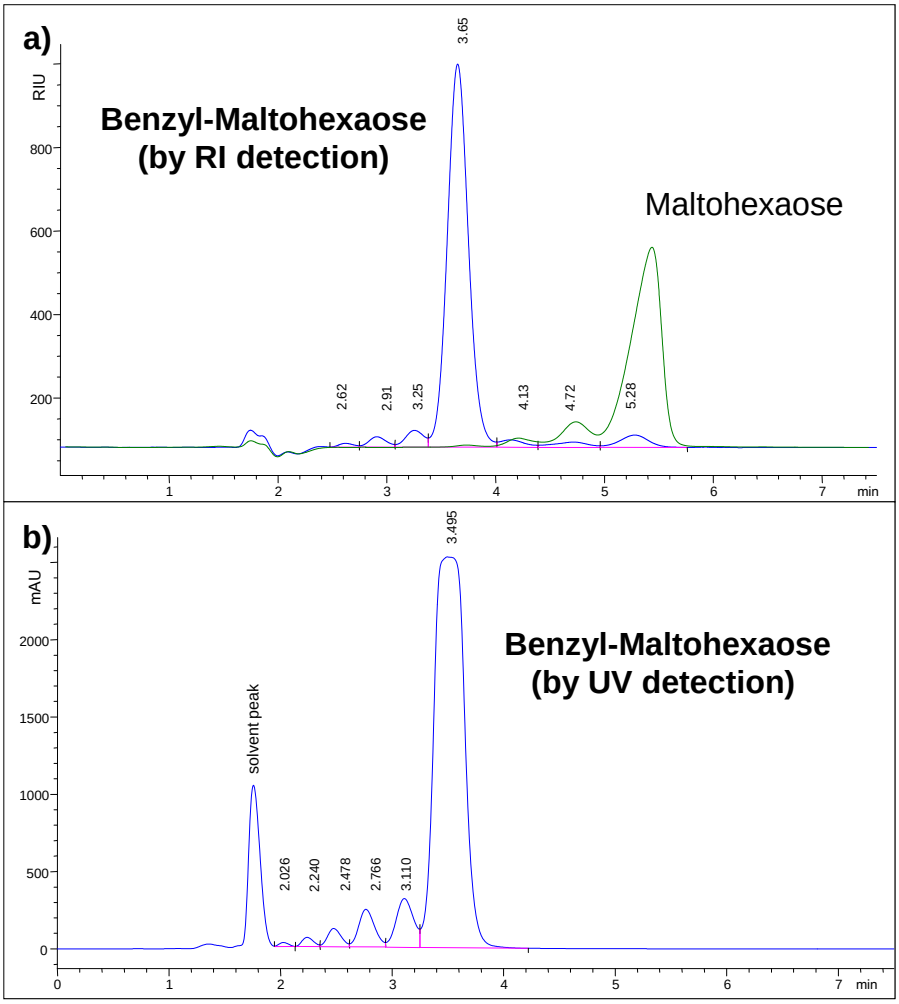



**Figure S13:** HPLC chromatogram of 1-*O*-benzylmaltohexaose and maltohexaose using refractive index detector (a) and DAD detector (b).

**Table S3:** Area percentage of the peaks detected by HPLC.

| sample | Composition (in area %) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Retention time of peak (min.) | | | | | | | | |
| | 2.6 | 2.9 | 3.3 | 3.6 | 4.1 | 4.6 | 5.1/5.3 | 5.9 | 6.6 |
| Benzyl-Maltohexaose | 0.6 | 1.9 | 3.3 | **86.5** | 1.9 | 2.0 | 3.9 | | |
| Benzyl-Maltoheptaose | 0.2 | 1.0 | 3.2 | 7.5 | **79.0** | 2.5 | 2.7 | 3.8 | |
| Benzyl-Maltooctaose | 0.4 | 1.1 | 2.6 | 4.8 | 5.5 | **75.6** | 2.9 | 2.2 | 5.1 |

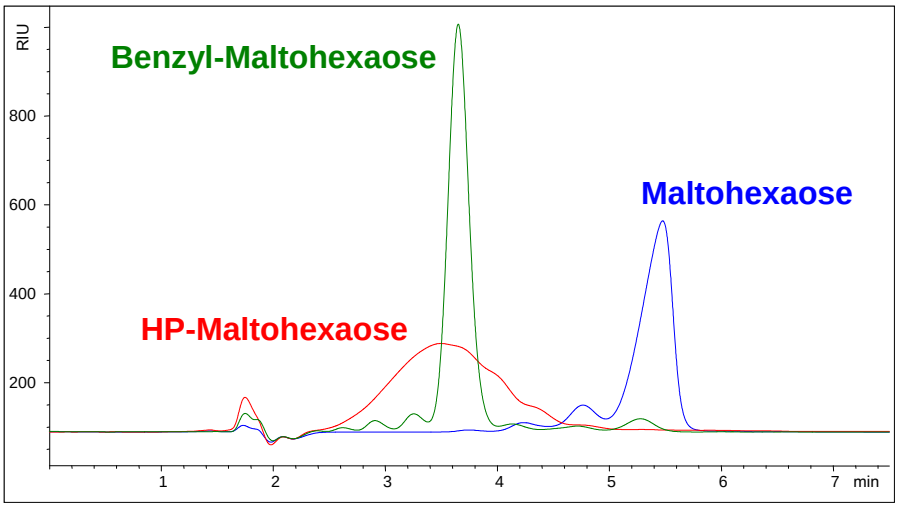



**Figure S14:** HPLC chromatogram of HP-maltohexaose compared to maltohexaose and O-benzyl-maltohexaose.