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| | | Characteristic $^1H$ NMR data in $D_2O$ | | | | | | $[\alpha]^{20}_D$ | | FAB HRMS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Yield | $OCH_3$ | | 3 eq. H | | $\varepsilon$-$CH_2$ | 3 ax. H | [°] | Formula | Calc. M | Found [M+H$^+$ |
| | [%] | δ [ppm] | # of H | δ [ppm] | # of H | δ [ppm] | δ [ppm] | | | | |
| Monomer | 62 | 3.08 | 3 | 2.19 | 1 | 2.14 | 1.45 | -14.8 | $C_{16}H_{31}N_3O_8$ | 393.21110 | 394.2181 |
| Dimer | 47 | 3.12 | 3 | 2.26 | 1 | 2.15 | 1.52 | -25.6 | $C_{26}H_{48}N_4O_{15}$ | 656.31159 | 657.3163 |
| | | 3.08 | 3 | 2.22 | 1 | | | | | | |
| Trimer | 44 | 3.12 | 6 | 2.30 | 1 | 2.15 | 1.55 | -43.8 | $C_{36}H_{65}N_5O_{22}$ | 919.41208 | 920.4214 |
| | | 3.09 | 3 | 2.27 | 1 | | | | | | |
| | | | | 2.25 | 1 | | | | | | |
| Tetramer | 52 | 3.12 | 3 | 2.30 | 1 | 2.15 | 1.55 | -66.6 | $C_{46}H_{82}N_6O_{29}$ | 1182.51257 | 1183.5172 |
| | | 3.11 | 6 | 2.28 | 1 | | | | | | |
| | | 3.09 | 3 | 2.25 | 1 | | | | | | |
| | | | | 2.22 | 1 | | | | | | |
| Pentamer | 55 | 3.12 | 12 | 2.29 | 4 | 2.15 | 1.55 | -25.0 | $C_{56}H_{99}N_7O_{36}$ | 1445.61306 | 1446.6168 |
| | | 3.08 | 3 | 2.25 | 1 | | | | | | |
| Hexamer | 47 | 3.12 | 15 | 2.25 | 5 | 2.17 | 1.57 | -26.2 | $C_{66}H_{116}N_8O_{43}$ | 1708.71355 | 1709.7306 |
| | | 3.08 | 3 | 2.22 | 1 | | | | | | |
| Heptamer | 43 | 3.12 | 3 | 2.30 | 6 | 2.17 | 1.57 | -33.0 | $C_{76}H_{133}N_9O_{50}$ | 1971.81404 | 1972.8317 |
| | | 3.12 | 15 | 2.28 | 1 | | | | | | |
| | | 3.08 | 3 | | | | | | | | |
| Octamer | 54 | 3.12 | 21 | 2.30 | 7 | 2.16 | 1.57 | -28.1 | $C_{86}H_{150}N_{10}O_{57}$ | 2234.91453 | 2235.9136 |
| | | 3.08 | 3 | 2.24 | 1 | | | | | | |
| | | | | | | | | | | | |

Table 2: Characterization Data for the Sialooligomers.

## Figure Captions (Supplementary Material)

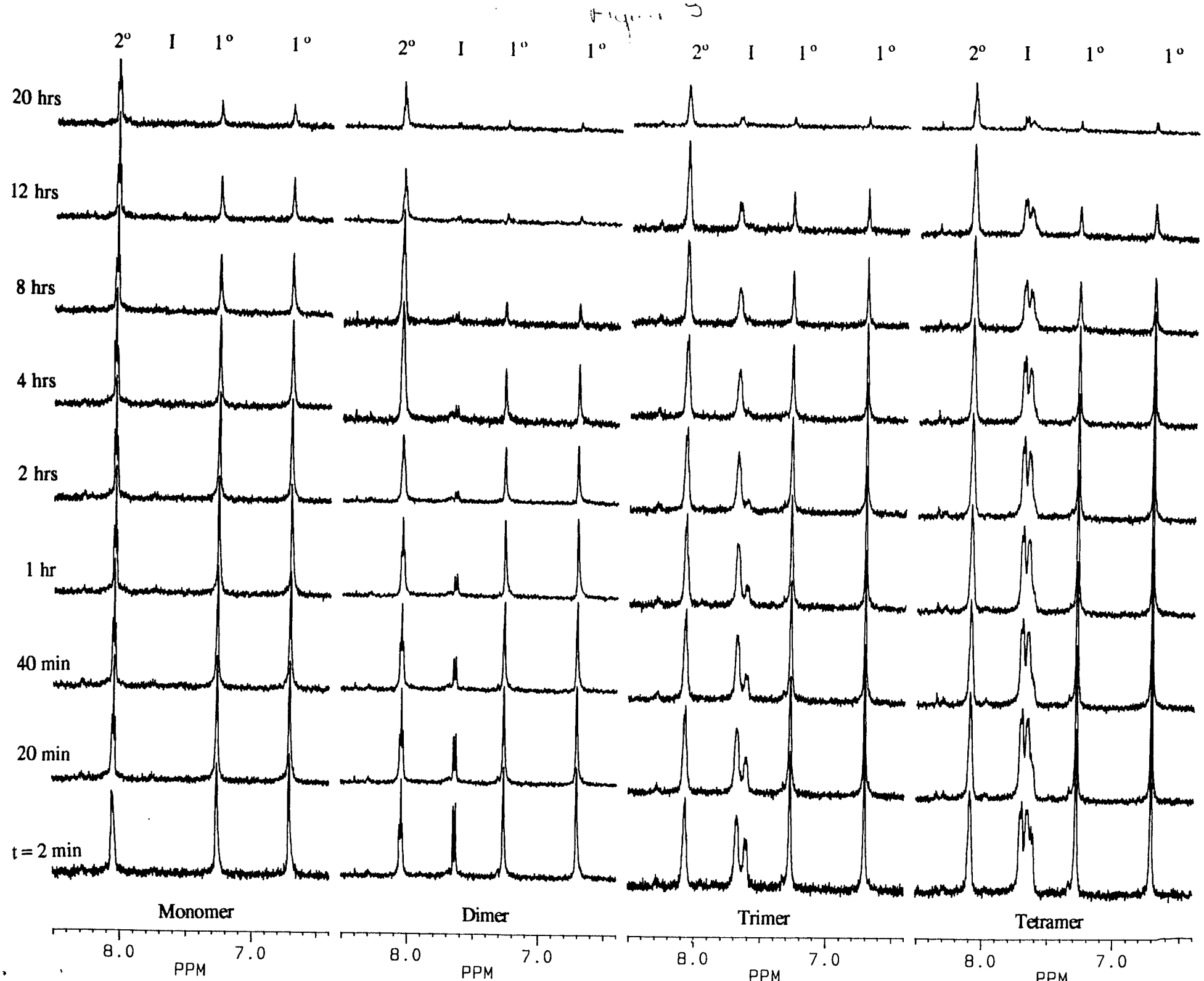
Figure 5: NH/ND exchange plots of amide protons, δ=6.5-8.5 ppm, for sialooligomers monomer through tetramer.

Figure 6: NH/ND exchange plots of amide protons,δ=6.5-8.5 ppm, for sialooligomers pentamer through octamer.

Figure 7: Individually resolved internal amide peaks of dimer, trimer, and tetramer.

Figure 8: Pseudo-first-order linear fit calculations for internal amides of sialooligomers dimer through pentamer. (Oligomers>5 calculated from data collected after end amide exchange).

Figure 9: Pseudo-first-order linear fit calculations for internal amides of sialooligomers hexamer through octamer, calculated from data collected after end amide exchange.



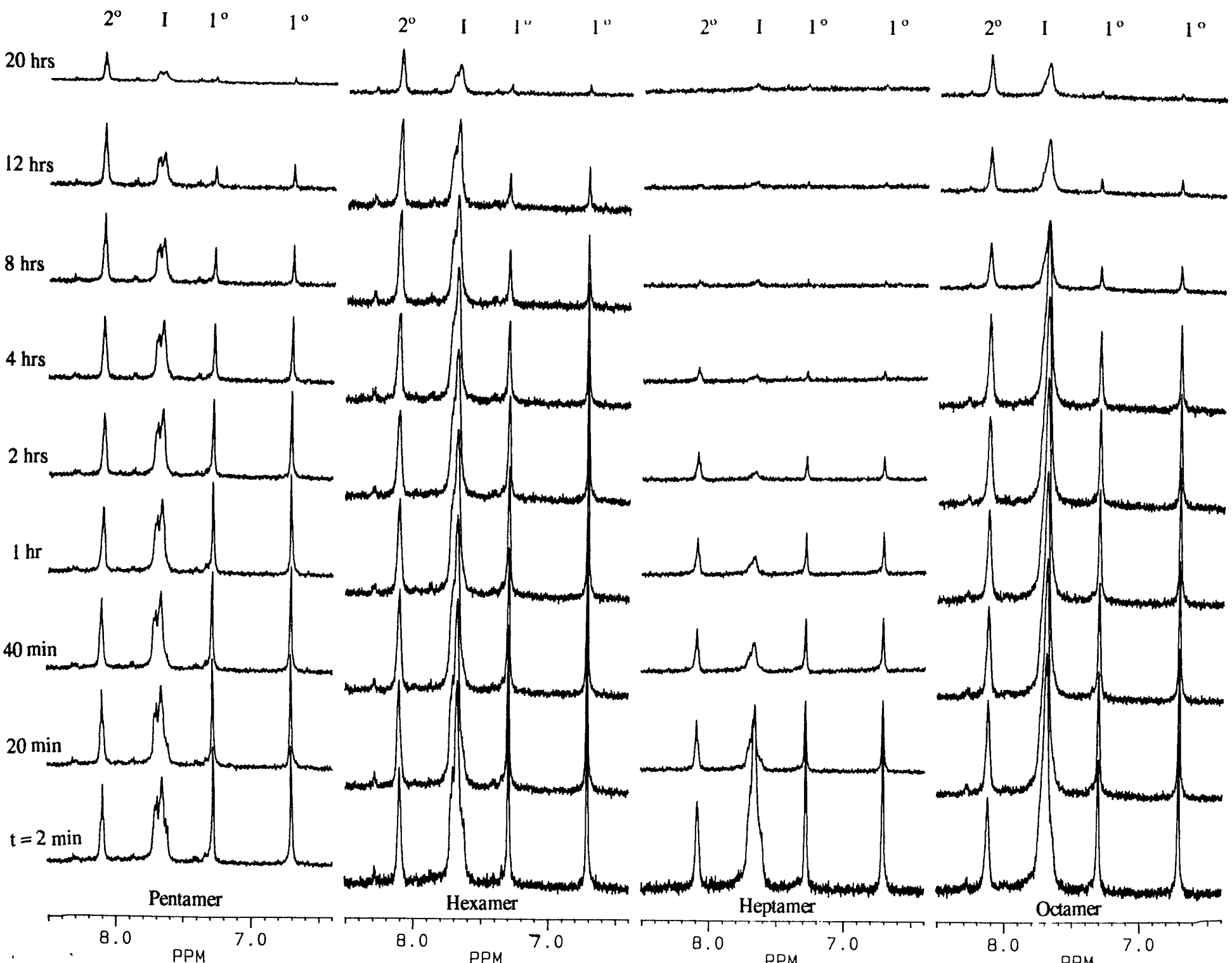


Figure 7

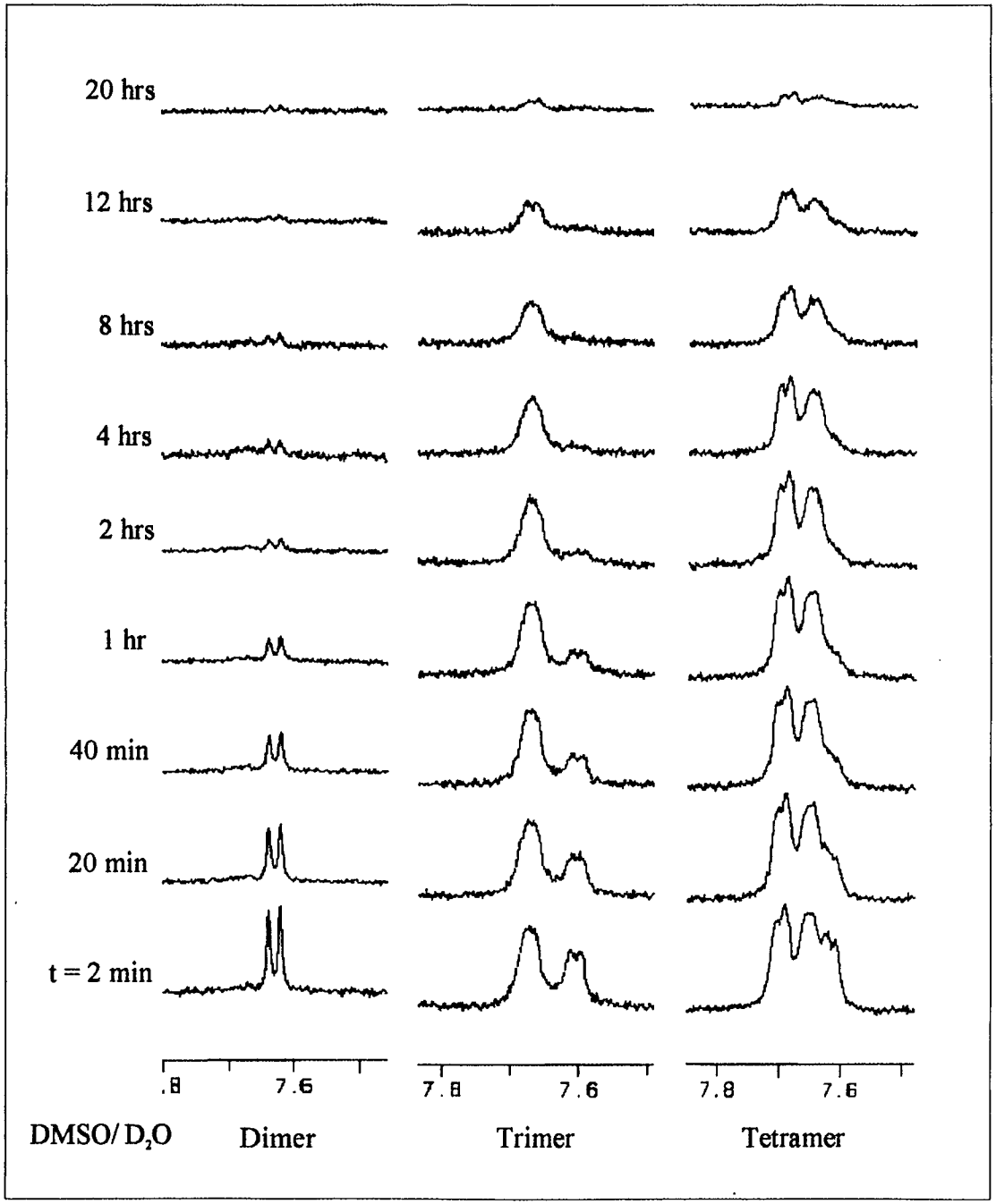
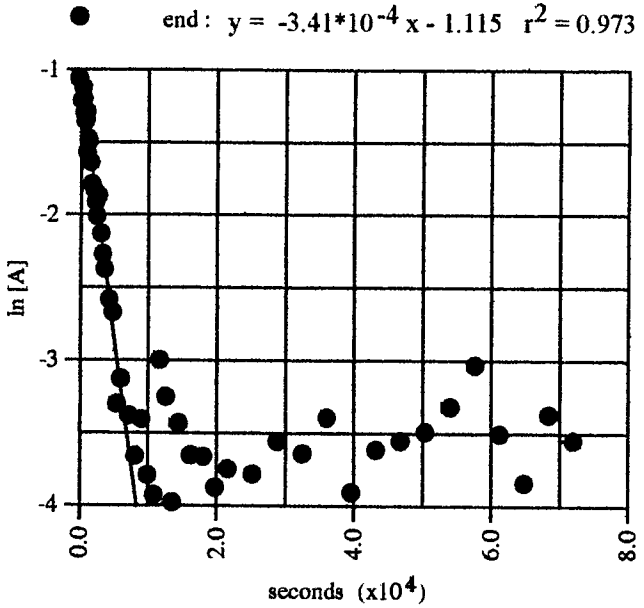
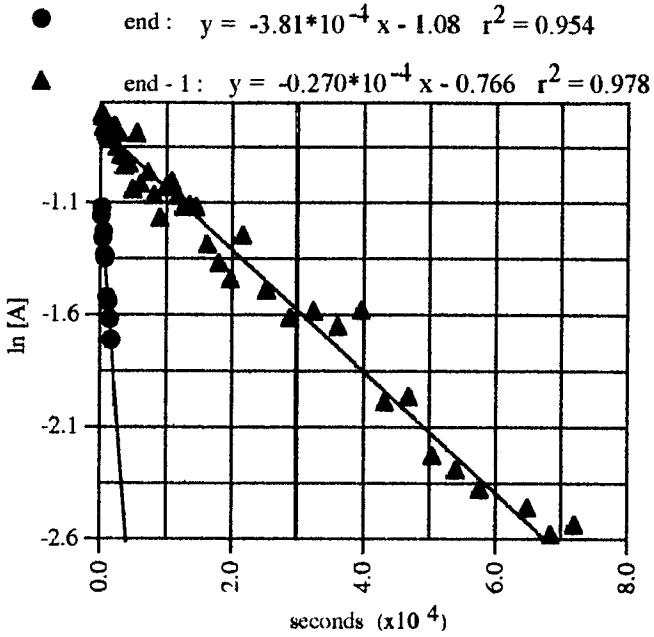


Figure 8

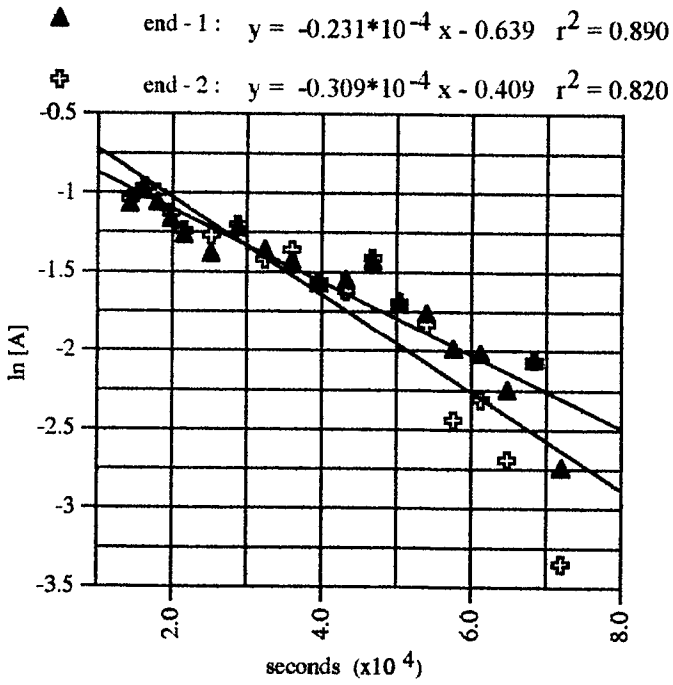
## Dimer Internal Amide:




## Trimer Internal Amides:




## Tetramer Internal Amides:




## Pentamer Internal Amides:

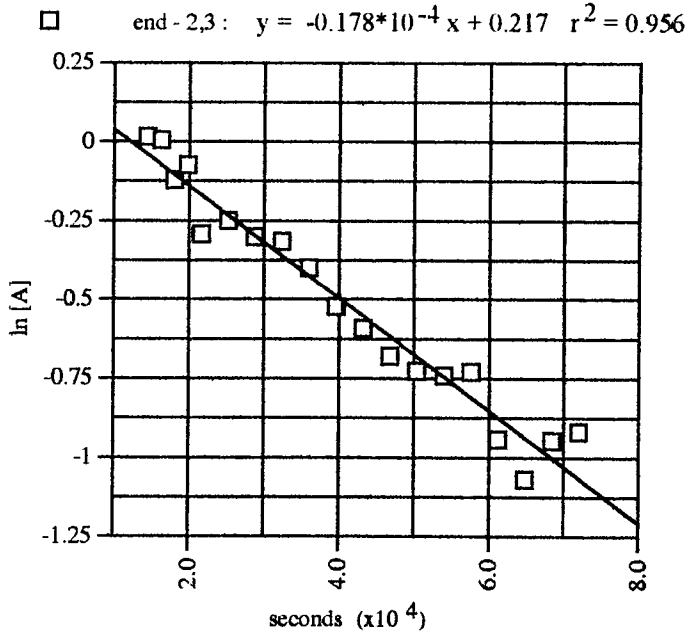
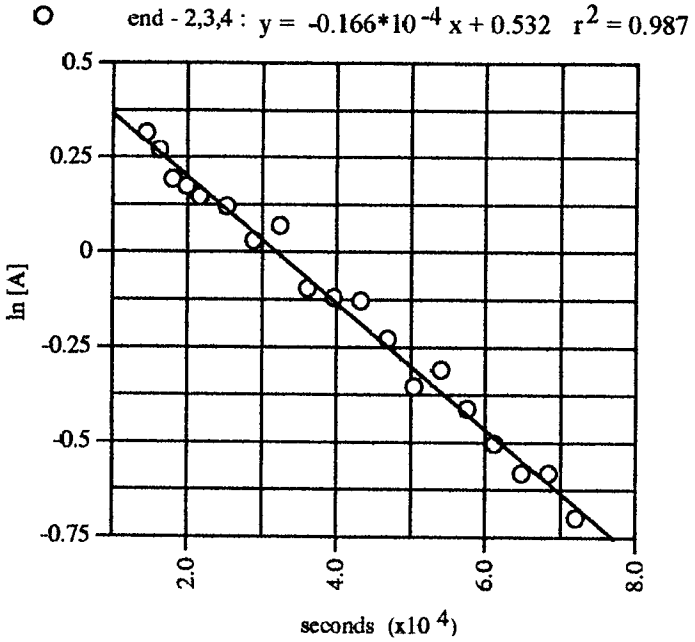
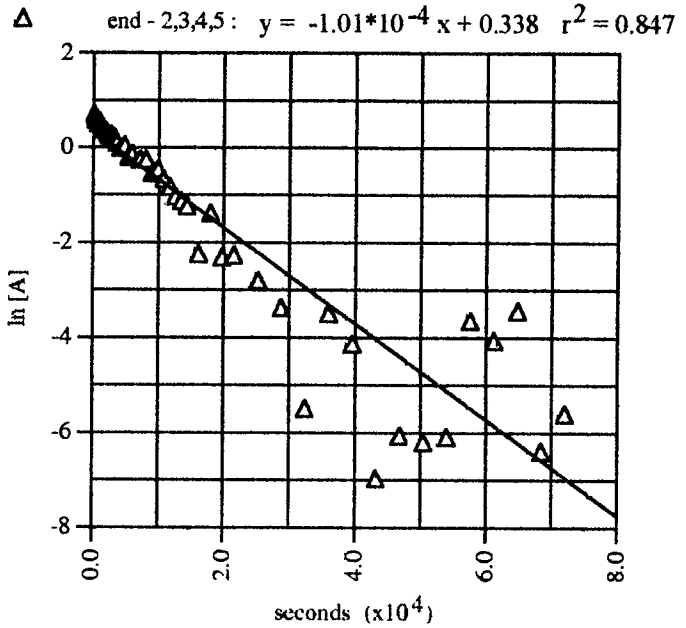


Figure 9

## Hexamer Internal Amides:




## Heptamer Internal Amides:




## Octamer Internal Amides: