

Reference material

Table 1 – Reference material: List of oligomers identified by ESMS studies of APS derived sols (corresponding to Figure 1 in the article)

Structure	Molecular weight
$\text{Si}_3 (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_3\text{O}_3(\text{OH})_3$	357
$\text{Si}_4 (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_4\text{O}_5(\text{OH})_2$	458
$\text{Si}_5 (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_5\text{O}_7(\text{OH})$	559
$\text{Si}_6 (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_6\text{O}_9$	660
$\text{Si}_7 (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_6\text{O}_{10} (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH})$	761
$\text{Si}_8 (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_8\text{O}_{11}(\text{CH}_2\text{CH}_2\text{CH}_2\text{NH})_2$	862
$\text{Si}_9 (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_9\text{O}_{13}(\text{OH})$	1000
$\text{Si}_{10} (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_{10}\text{O}_{14}(\text{OH})$	1118
$\text{Si}_{11} (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_{11}\text{O}_{16}(\text{OH})_2$	1236
$\text{Si}_{12} (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_{12}\text{O}_{16}(\text{OH})_4$	1356
$\text{Si}_{13} (\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_{13}\text{O}_{17}(\text{OH})_7$	1493

SAXS Characterization

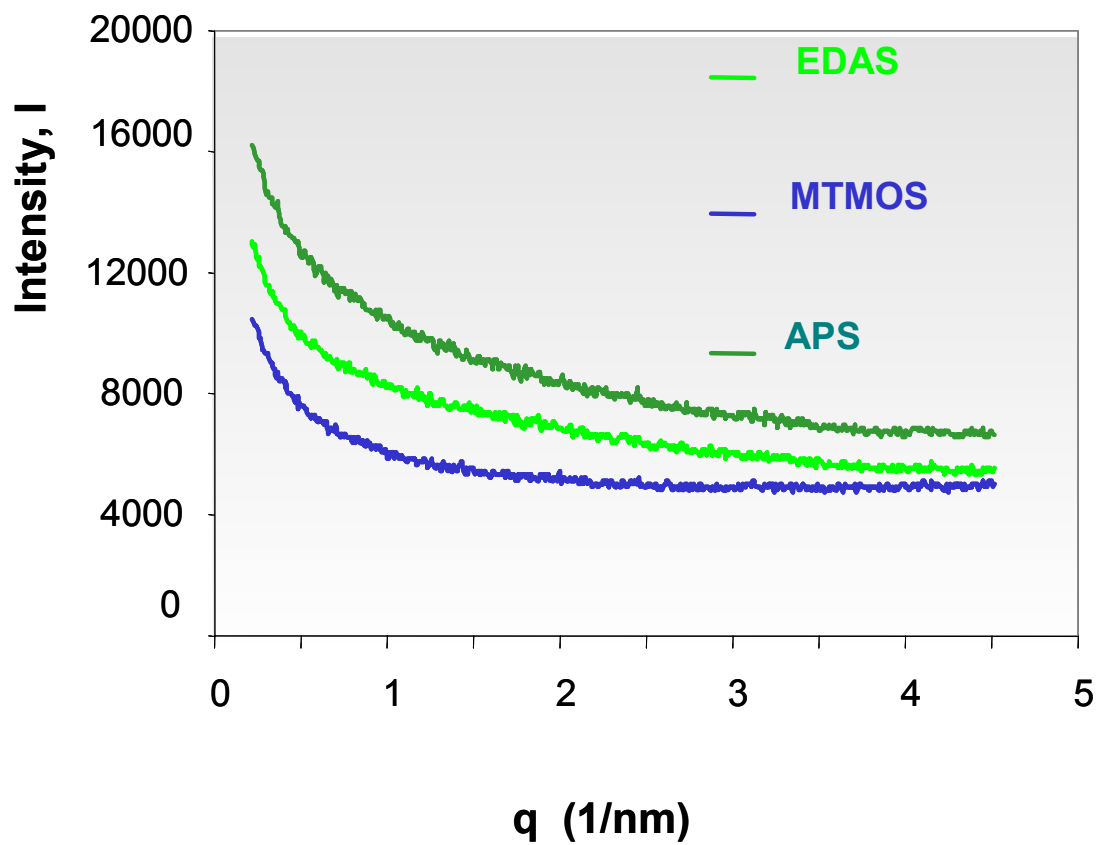


Figure 1 – Reference materials: SAXS spectra of APS, EDAS and MTMOS derived sols prepared as detailed in the Experimental Section.

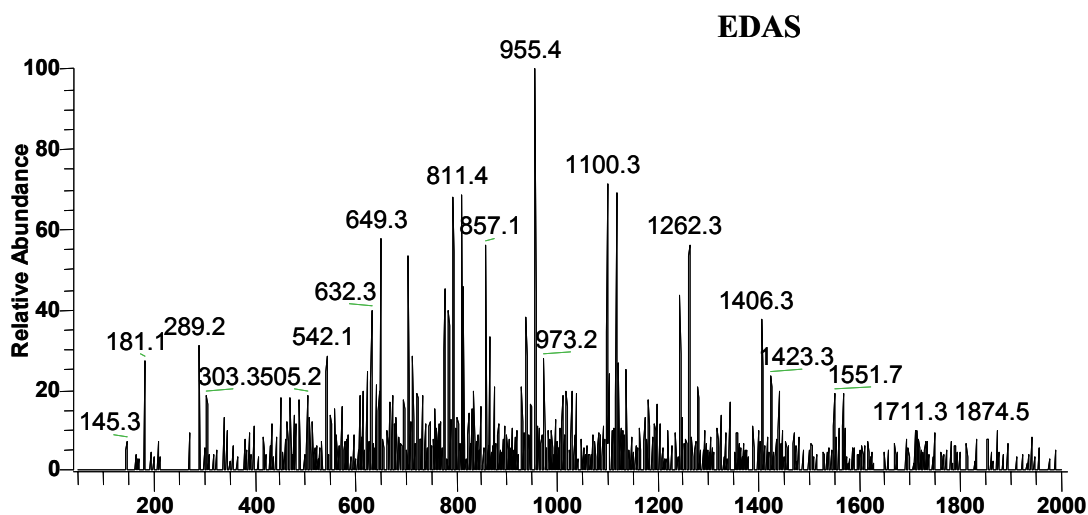
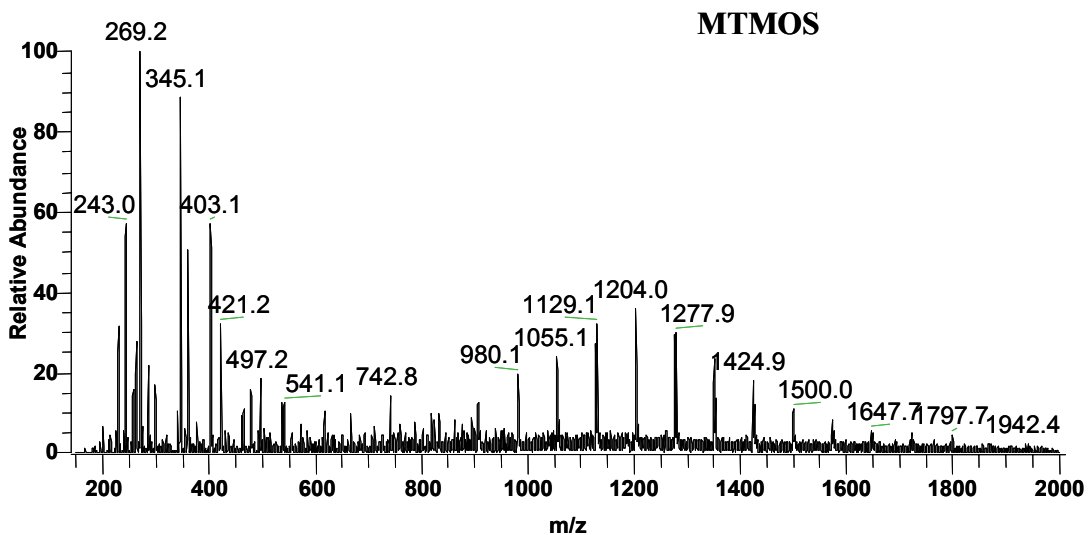


Figure 2 – Reference material: ESMS spectra of MTMOS (up) and EDAS (lower frame) derived sol. Sol preparation conditions are identical to that described in the experimental section. The sol was analyzed as is without pH correction. ESMS conditions are positive mode, heated capillary temperature 170°C; spray voltage 4kV; capillary voltage 46 V. Mass spectra were acquired by scanning the mass analyzer from m/z 50 to 2000 with 5 total microscans and maximum injection time 50ms. The MS flow rate was 10 μ L/min