

Scattering length densities ( $\rho$ ) for various polymers and solvents. The columns headed M and  $\rho_m$  are the molecular mass and bulk density, respectively. G3 PBE Dendrimer etc. are Third (Fourth, ...) generation poly(benzyl ether) dendrimers.<sup>1,2</sup> HBP H20 is a pseudo second generation hyperbranched polymer, the molecular mass and formula are approximate.<sup>3</sup> The radiation wavelength was assumed 1.54 Å, little dispersion in the scattering length densities is seen for most compounds.

Source: <http://www.ncnr.nist.gov/resources/sldcalc.html>.

Compound	Formula	M / Da	$\rho_m$ / g-cc <sup>-1</sup>	Cu K $\alpha$ X-rays	SANS
				$\rho$ / 10 <sup>-6</sup> Å <sup>-2</sup>	$\rho$ / 10 <sup>-6</sup> Å <sup>-2</sup>
<b>Polymers</b>					
Ethylene Monomer	-C <sub>2</sub> H <sub>4</sub> -	28	0.92	8.73	-0.33
	-C <sub>2</sub> D <sub>4</sub> -	32	1.1	9.33	8.24
Styrene Monomer	-C <sub>8</sub> H <sub>8</sub> -	104	1.05	9.60	1.41
	-C <sub>8</sub> D <sub>8</sub> -	112	1.13	9.59	6.42
Poly(ethylene oxide) Monomer	-C <sub>2</sub> H <sub>4</sub> O-	44	1.13	10.5	0.639
	-C <sub>2</sub> D <sub>4</sub> O-	48	~1.22	10.5	7.00
Lactide Monomer	-C <sub>3</sub> H <sub>4</sub> O <sub>2</sub> -	72	1.25	11.2	1.73
	-C <sub>3</sub> D <sub>4</sub> O <sub>2</sub> -	76	~1.3	11.1	5.99
Glycolide Monomer	-C <sub>2</sub> H <sub>2</sub> O <sub>2</sub> -	58	~1.3	11.5	2.35
Caprolactone Monomer	-C <sub>6</sub> H <sub>10</sub> O <sub>2</sub> -	114	1.15	10.6	0.86
G3 PBE Dendrimer	C <sub>105</sub> H <sub>92</sub> O <sub>15</sub>	1,592	1.19	10.7	1.98
G4 PBE Dendrimer	C <sub>217</sub> H <sub>188</sub> O <sub>31</sub>	3,288	1.21	10.9	2.03
d-G4 PBE Dendrimer	C <sub>217</sub> D <sub>112</sub> H <sub>76</sub> O <sub>31</sub>	3,400	~1.21	11.2	5.84
G5 PBE Dendrimer	C <sub>441</sub> H <sub>380</sub> O <sub>63</sub>	7,688	1.22	11.0	2.06
G6 PBE Dendrimer	C <sub>889</sub> H <sub>764</sub> O <sub>127</sub>	13,464	1.19	10.7	2.01
HBP H20	C <sub>74</sub> H <sub>126</sub> O <sub>45</sub>	1734	~1.2	11.0	1.17
PAMAM Dendrimer <sup>4</sup>					1.48
PAMAM Monomer	C <sub>5</sub> H <sub>9</sub> N <sub>2</sub> O	113	~1.1	10.1	1.41
<b>Solvents</b>					
Water	H <sub>2</sub> O	18	1.00	9.46	-0.56
	D <sub>2</sub> O	20	1.11	9.42	6.37
THF	C <sub>4</sub> H <sub>8</sub> O	72	0.886	8.36	0.18
	C <sub>4</sub> D <sub>8</sub> O	80	0.985	8.34	6.35
Chloroform	CHCl <sub>3</sub>	119	1.49	12.5	2.38
	CDCl <sub>3</sub>	120	1.50	12.5	3.16
NMP	C <sub>5</sub> H <sub>8</sub> NO	98	1.03	9.47	1.17
Benzene	C <sub>6</sub> H <sub>6</sub>	78	0.874	7.99	1.18
	C <sub>6</sub> D <sub>6</sub>	84	0.950	8.07	5.43
Cyclohexane	C <sub>6</sub> H <sub>12</sub>	84	0.779	7.56	-0.278
	C <sub>6</sub> D <sub>12</sub>	96	0.893	7.57	6.70
m-Terphenyl	C <sub>18</sub> H <sub>14</sub>	230	1.05	9.46	1.85
Methanol	CH <sub>3</sub> OH	32	0.791	7.57	-0.373
	CD <sub>3</sub> OH	35	0.867	7.58	4.28

<sup>1</sup> C. J. Hawker and J. M. J. Fréchet, "Preparation of polymers with controlled molecular architecture. A new convergent approach to dendritic macromolecules," J. Am. Chem. Soc., **112** (1990) 7638-7647.

<sup>2</sup> M. E. Mackay, G. Hay and C. J. Hawker, "On the thermodynamic properties of dendrimers compared to linear polymers: General observations," J. Poly. Sci. Part B: Poly. Phys., **39** (2001) 1766-1777.

<sup>3</sup> E. Malmström, M. Johansson and A. Hult, "Hyperbranched aliphatic polyesters," Macromolecules, **28** (1995) 1689-1703.

<sup>4</sup> Determined from contrast matching of G7 PAMAM in d/h Methanol, A. Topp, B. Bauer, D. Tomalia and E. Amis, "Effect of Solvent Quality on the Molecular Dimensions of PAMAM Dendrimers," Macromolecules, **32** (1999) 7232-7237.