Hydrophobic heteroboroxine-polydimethylsiloxane thin layers

M. Srb[1], R. Jambor[1], M. Novák[2], Š. Podzimek[2]

[1] *Department of General and Inorganic Chemistry, Faculty of Chemical Technology, University of Pardubice, Czech Republic, Studentská 573, 532 10 Pardubice 2, Czechia*
[2] *Institute of Chemistry and Technology of Macromolecular Materials, , Faculty of Chemical Technology, University of Pardubice, Czech Republic, Studentská 573, 532 10 Pardubice 2, Czechia*

Polydimethylsiloxanes (PDMS) can form hydrophobic thin layers with water contact angles (WCAs) of up to 115°. We modified aminopropyl-terminated polydimethylsiloxanes (with four different molar masses) using gallium- and tin-based heteroboroxines via a Schiff base coupling reaction. The resulting compounds were spin-coated onto three substrates (silicon, glass, and polyethylene), and their hydrophobicity was evaluated by WCA measurements.

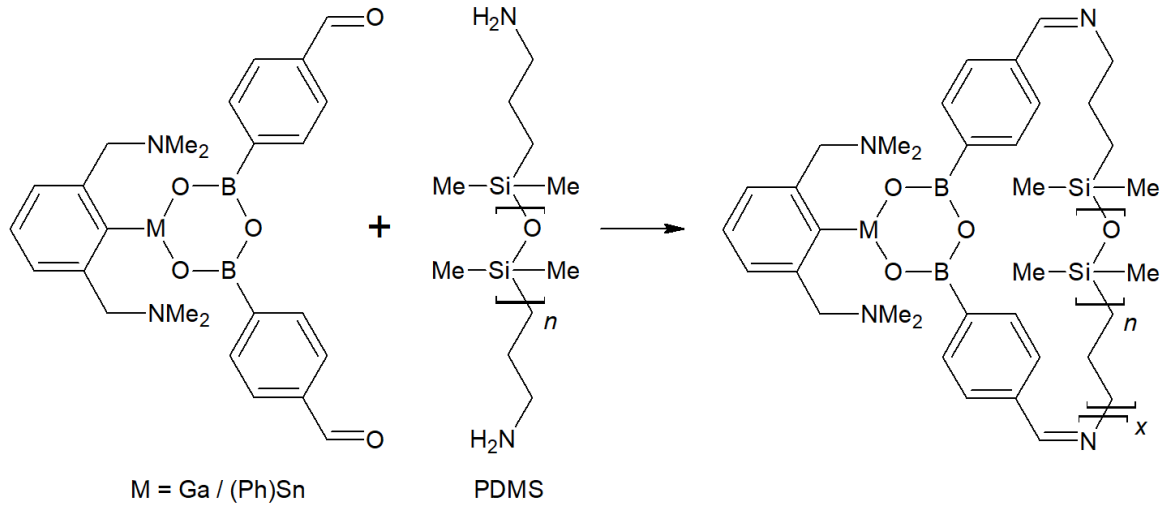

Figure 1 Preparation of heteroboroxine-polydimethylsiloxane polymers

Table 1 Selected WCAs on heteroboroxine-PDMS thin layers on three substrates spin-coated from CH_2Cl_2 solution with concentration 50 g.l^{-1}

M	M_w (PDMS)	silicon substrate	glass substrate	polyethylene substrate	M	M_w (PDMS)	silicon substrate	glass substrate	polyethylene substrate
—	1000000	113°	107°	104°	—	1000000	113°	107°	104°
Ga	900	97°	100°	120°	Sn	900	101°	104°	125°
Ga	3000	105°	102°	118°	Sn	3000	130°	128°	130°
Ga	5000	116°	117°	134°	Sn	5000	109°	108°	126°
Ga	27000	112°	111°	130°	Sn	27000	107°	115°	125°

Keywords: heteroboroxines, thin layers, hydrophobicity

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