Table 2

Ex#	[HEMA] wt%	[NVP] wt%	HEMA: NVP[1]	HO:Si (mol.)	% H_2O	% Haze	DCA	Mechanicals		Dk
								Mod. (psi)	Elong. (%)	
3	5.75	52.50	0.0935	0.10	61.8 (0.1)	479 (8)	62 (4)	53.2 (2.5)	162.6 (34.8)	102.1
4	6.75	51.50	0.112	0.12	61.4 (0.2)	464 (20)	54 (6)	57.9 (3.6)	187.3 (51.1)	98.3
5	7.75	50.50	0.131	0.14	58.9 (0.1)	233 (59)	58 (5)	61.6 (5.2)	189.8 (50.4)	102.1
6	8.75	49.50	0.152	0.16	58.2(0.2)	17(17)	60(5)	67.0 (3.9)	157.4(43.8)	100.3
7	9.75	48.50	0.172	0.17	60.0(0.3)	5(1)	59.5(5)	70.6(4)	159.2(47.5)	96.3
8	10.75	47.50	0.193	0.19	59.1 (0.0)	8 (0)	60 (7)	79.9 (1.9)	196.2 (24.6)	89.1
9	15.75	42.50	0.316	0.28	55.7 (0.0)	11 (1)	70 (7)	97.5 (4.2)	192.8 (39.2)	83.5
10	18.75	39.50	0.405	0.33	51.7 (0.1)	16 (2)	* NW	102.5 (4.0)	180.6 (38.6)	77.3
11	21.75	36.50	0.509	0.39	49.7 (0.1)	44 (2)	* NW	115.9 (3.1)	206.3 (53.8)	62.3
12	25.75	32.50	0.677	0.46	46.5 (0.3)	112 (4)	* NW	119.6 (6.9)	199.5 (46.6)	63.2
13	29.00	29.25	0.839	0.52	40.7 (0.2)	186 (3)	* NW	138.8 (6.7)	190.7 (32.4)	59.7

1 molar ratio

* NW = Not Wettable

Table 3

Ex.#	Component	HOMA: NVP	HO:Si	% H_2O	% Haze	DCA	Mod. (psi)	Elong. (%)	Dk
8	HEMA	0.193	0.18	59.1 (0.0)	8 (0)	60 (7)	79.9 (1.9)	196.2 (24.6)	89.1
14	HPMA	0.174	0.17	58.9 (0.1)	16 (0)	63 (5)	73.4 (1.5)	230.1 (1.8)	98.5
15	HBMA	0.159	0.16	55.2 (0.2)	515 (4)	NT	NT	NT	NT
16	DMHEMA	0.159	0.16	62.3 (0.1)	519 (3)	NT	NT	NT	NT

Table 4

Example	17	18	19	20	21	22
Component	**HPMA**	**HBMA**	**DMHEMA**	**HEAA**	**GMMA**	**GMMA**
NVP (wt%)	47.5	45.18	45.18	48.75	45.01	51.63
HOMA Cpd (wt%)	10.75	13.07	13.07	9.50	13.23	6.62
HOMA:NVP (molar)	0.174	0.203	0.203	0.188	0.408	0.204
HO:Si	0.19	0.19	0.19	0.19	0.38	0.19
% H_2O	58.9 (0.1)	54.5	60.4	NT*	NT*	62.6
% Haze	16 (0)	8	15	NT*	NT*	12
DCA	63 (5)	46	70	NT*	NT*	49
MOD (psi)	73.4 (1.4)	120.5	68.7	NT*	NT*	70.4
Elong (%)	230.1 (1.8)	179.3	206.5	NT*	NT*	203.5
Dk	93.4	93.4	90	NT*	NT*	85.3

NT* = Not Tested

Table 6a

Example	25	26	27	28	29	30
Component	**SiMAA**	**SiMAA**	**OH-mPDMS (n=4)**	**SA2**	**SiMAA**	**SiMAA**
mPDMS 1000	38.50	16.67	0.00	0.00	0.00	0.00
NVP	23.35	45.18	45.18	45.18	45.18	61.85
HOSiMA Cpd	34.90	34.90	51.57	51.57	51.57	34.90
HOSiMA: NVP (molar)	0.393	0.203	0.207	0.237	NC	NC
HO_{total}:Si	0.12	0.19	0.2	0.4	0.33	0.33
TEGDMA	1.00	1.00	1.00	1.00	1.00	1.00
Norbloc	2.00	2.00	2.00	2.00	2.00	2.00
CGI 819	0.25	0.25	0.25	0.25	0.25	0.25
Diluent	20.00	20.00	20.00	20.00	20.00	20.00
TAA	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**
DA	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**

Table 6b

Ex. #	% H_2O	% Haze	DCA	Mechanicals		Dk
				Mod. (psi)	Elong. (%)	
28	NT	117 (4)	72 (21)	NT	NT	NT
30	60.7 (0.2)	7 (0)	33 (3)	370.8 (30.1)	130.5 (22.9)	41
29	45.4 (0.3)	7 (0)	37 (4)	705.2 (81.7)	122.2 (14.7)	46

Table 7

Example	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Component	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
mPDMS 1000	20	20	20	20	20	00	0	20	20	20
TRIS	20	0	0	0	0	0	0	0	20	20
OH-mPDMS, n=4	0	0	0	20	20	40	40	0	0	0
SiMAA	0	20	20	0	0	0	0	0	0	0
Macromer III	0	0	0	0	0	0	0	20	0	0
acPDMS 1000	5	0	0	0	0	0	0	0	0	0
NVP	49	52	47	52	47	52	47	47	52	47.00
HEMA	5.75	5.75	10.75	5.75	10.75	5.75	10.75	10.75	5.75	10.75
TEGDMA	0	2	2	2	2	2	2	2	2	2
CGI 819	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

	31	32	33	34	35	36	37	38	39	40
Property										
% H_2O	46.4 (0.2)	53.9 (0.7)	51.8 (0.1)	NT	54.1 (0.2)	55.6 (0.1)	53.5 (0.1)	43.6 (0.7)	57.5(0.2)	57.3 (0.1)
HO:Si	0.11	0.25	0.36	0.20	0.30	0.34	0.45	?	0.11	0.20
% Haze	260 (10)	193 (21)	12 (0)	NT	22 (1)	163 (6)	12 (1)	64 (9)	259(36)	22 (0)
DCA	75 (16)	55 (4)	52 (2)	NT	50 (5)	58 (1)	56 (3)	NT	63(9)	NT
Dk	NT	NT	62	NT	88	NT	73	NT	NT	84

Table 10

Comp.	**Ex49**	**Ex50**	**Ex51**	**Ex52**	**Ex53**	**Ex 54**	**Ex 55**	**Ex 56**	**Ex 57**	**Ex 58**
mPDMS 1000	29.5	35.5	38.5	41.5	44.5	20.5	25.5	29.5	38.5	41.5
NVP	60.5	54.5	51.5	48.5	45.5	69.5	64.75	59.75	50.75	47.75
GMA	6.75	6.75	6.75	6.75	6.75	5.75	5.75	6.75	6.75	6.75
TEGDMA	1	1	1	1	1	2	1.75	1.75	1.75	1.75
Norbloc	2	2	2	2	2	2	2	2	2	2
CGI 819	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

Table 14

Ex.#	[mPDMS] %	[HEMA] %	[NVP] %	HO:Si	% H_2O	% Haze	DCA	Mechanicals		Dk
								Mod. (psi)	Elong. (%)	
59	20.5	10.75	65.5	0.36	70.5 (0.2)	4 (1)	55 (6)	51.0 (6.3)	208.7 (37.5)	48.9
60	20.5	5.75	70.5	0.19	78.1(0.1)	6(0)	50(6)	30.8(2.6)	224.9(29.6)	58.1
61	29.5	10.75	56.5	0.25	65.2 (0.2)	7 (0)	56 (4)	59.1 (1.8)	204.6 (21.4)	63.6
62	35.5	10.75	50.5	0.21	63.2 (0.3)	7 (0)	53 (4)	64.3 (3.2)	208.4 (34.3)	75.0
63	38.5	10.75	47.5	0.19	59.0 (0.1)	9 (1)	54 (3)	70.1 (5.1)	245.0 (62.1)	91.0
64	41.5	10.75	44.5	0.18	NT	NT	NT	NT	NT	NT
65	44.5	10.75	41.5	0.17	52.2 (0.3)	9 (0)	56 (5)	93.7 (5.6)	162.9 (22.4)	114.2
66	47.5	10.75	38.5	0.16	51.6 (0.3)	9 (1)	63 (7)	89.5 (5.3)	163.2 (56.1)	118.4
67	50.5	10.75	35.5	0.15	47.0 (0.4)	10 (1)	119 (4)	103.7 (7.3)	153.7 (39.7)	134.9

As can be seen from the data in Table 14, the present invention provides a wide range of formulations which produce contact lenses having very low haze. The silicone component, mPDMS could be included in amounts up to about 50 wt% and still produce contact lenses having a desirable balance of water content, advancing contact angle and oxygen permeability. The properties of the lenses of Example 64 were not tested. All the formulations had HO:Si within the ranges of the present invention.

Examples 68-73

A reaction mixture was formed by mixing the components listed in Table 15 and degassed by applying vacuum at ambient temperature for about 17(±3) minutes. The amounts of the reaction components are listed as the weight % of reaction components, without diluent. The reaction mixture was mixed with the diluents listed in Table 16 to form the reaction mixtures. The reaction mixture (75 μL) was then dosed at room temperature and <0.1% O_2, into thermoplastic contact lens molds (FC – Zeonor, BC Polypropylene) which had been degassed in N_2 box at RT (Compartment 1, Figure 1) for a minimum of 12 hours prior to dosing. The BC was placed on the FC mold to produce 8 BC/FC assemblies in a pallet. Eight pallets were prepared, moved into the cure compartment (Compartment 2) and placed on a mirrored surface. A quartz plate (12.50 mm x 6.25 mm x 0.50 mm) was placed over each pallet and the lenses were and cured for 20 minutes, at an intensity of 4 – 5 mW/cm^2, <0.1% O_2, and 62-65°C.

The molds for all the lenses were manually demolded (lenses remained in FC). The lenses were dry released by pressing on the back of the front curve. Lenses were extracted in DI water

All lenses were stored in borate buffered packing solution in lens vials and sterilized at 122°C for 30 minutes. The properties of the lenses are shown in Table 17.

Table 15

Base Formulation

Table 2

Ex#	[HEMA] wt%	[NVP] wt%	HEMA: NVP[1]	HO:Si (mol.)	% H_2O	% Haze	DCA	Mechanicals		Dk
								Mod. (psi)	Elong. (%)	
3	5.75	52.50	0.0935	0.10	61.8 (0.1)	479 (8)	62 (4)	53.2 (2.5)	162.6 (34.8)	102.1
4	6.75	51.50	0.112	0.12	61.4 (0.2)	464 (20)	54 (6)	57.9 (3.6)	187.3 (51.1)	98.3
5	7.75	50.50	0.131	0.14	58.9 (0.1)	233 (59)	58 (5)	61.6 (5.2)	189.8 (50.4)	102.1
6	8.75	49.50	0.152	0.16	58.2(0.2)	17(17)	60(5)	67.0 (3.9)	157.4(43.8)	100.3
7	9.75	48.50	0.172	0.17	60.0(0.3)	5(1)	59.5(5)	70.6(4)	159.2(47.5)	96.3
8	10.75	47.50	0.193	0.19	59.1 (0.0)	8 (0)	60 (7)	79.9 (1.9)	196.2 (24.6)	89.1
9	15.75	42.50	0.316	0.28	55.7 (0.0)	11 (1)	70 (7)	97.5 (4.2)	192.8 (39.2)	83.5
10	18.75	39.50	0.405	0.33	51.7 (0.1)	16 (2)	* NW	102.5 (4.0)	180.6 (38.6)	77.3
11	21.75	36.50	0.509	0.39	49.7 (0.1)	44 (2)	* NW	115.9 (3.1)	206.3 (53.8)	62.3
12	25.75	32.50	0.677	0.46	46.5 (0.3)	112 (4)	* NW	119.6 (6.9)	199.5 (46.6)	63.2
13	29.00	29.25	0.839	0.52	40.7 (0.2)	186 (3)	* NW	138.8 (6.7)	190.7 (32.4)	59.7

1 molar ratio

* NW = Not Wettable

Table 3

Ex.#	Component	HOMA: NVP	HO:Si	% H_2O	% Haze	DCA	Mod. (psi)	Elong. (%)	Dk
8	HEMA	0.193	0.18	59.1 (0.0)	8 (0)	60 (7)	79.9 (1.9)	196.2 (24.6)	89.1
14	HPMA	0.174	0.17	58.9 (0.1)	16 (0)	63 (5)	73.4 (1.5)	230.1 (1.8)	98.5
15	HBMA	0.159	0.16	55.2 (0.2)	515 (4)	NT	NT	NT	NT
16	DMHEMA	0.159	0.16	62.3 (0.1)	519 (3)	NT	NT	NT	NT

Table 4

Example	17	18	19	20	21	22
Component	**HPMA**	**HBMA**	**DMHEMA**	**HEAA**	**GMMA**	**GMMA**
NVP (wt%)	47.5	45.18	45.18	48.75	45.01	51.63
HOMA Cpd (wt%)	10.75	13.07	13.07	9.50	13.23	6.62
HOMA:NVP (molar)	0.174	0.203	0.203	0.188	0.408	0.204
HO:Si	0.19	0.19	0.19	0.19	0.38	0.19
% H_2O	58.9 (0.1)	54.5	60.4	NT*	NT*	62.6
% Haze	16 (0)	8	15	NT*	NT*	12
DCA	63 (5)	46	70	NT*	NT*	49
MOD (psi)	73.4 (1.4)	120.5	68.7	NT*	NT*	70.4
Elong (%)	230.1 (1.8)	179.3	206.5	NT*	NT*	203.5
Dk	93.4	93.4	90	NT*	NT*	85.3

NT* = Not Tested

Table 6a

Example	25	26	27	28	29	30
Component	**SiMAA**	**SiMAA**	**OH-mPDMS (n=4)**	**SA2**	**SiMAA**	**SiMAA**
mPDMS 1000	38.50	16.67	0.00	0.00	0.00	0.00
NVP	23.35	45.18	45.18	45.18	45.18	61.85
HOSiMA Cpd	34.90	34.90	51.57	51.57	51.57	34.90
HOSiMA: NVP (molar)	0.393	0.203	0.207	0.237	NC	NC
HO_{total}:Si	0.12	0.19	0.2	0.4	0.33	0.33
TEGDMA	1.00	1.00	1.00	1.00	1.00	1.00
Norbloc	2.00	2.00	2.00	2.00	2.00	2.00
CGI 819	0.25	0.25	0.25	0.25	0.25	0.25
Diluent	20.00	20.00	20.00	20.00	20.00	20.00
TAA	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**
DA	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**	**50.00**

Table 6b

Ex. #	% H_2O	% Haze	DCA	Mechanicals		Dk
				Mod. (psi)	Elong. (%)	
28	NT	117 (4)	72 (21)	NT	NT	NT
30	60.7 (0.2)	7 (0)	33 (3)	370.8 (30.1)	130.5 (22.9)	41
29	45.4 (0.3)	7 (0)	37 (4)	705.2 (81.7)	122.2 (14.7)	46

Table 7

Example	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Component	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
mPDMS 1000	20	20	20	20	20	00	0	20	20	20
TRIS	20	0	0	0	0	0	0	0	20	20
OH-mPDMS, n=4	0	0	0	20	20	40	40	0	0	0
SiMAA	0	20	20	0	0	0	0	0	0	0
Macromer III	0	0	0	0	0	0	0	20	0	0
acPDMS 1000	5	0	0	0	0	0	0	0	0	0
NVP	49	52	47	52	47	52	47	47	52	47.00
HEMA	5.75	5.75	10.75	5.75	10.75	5.75	10.75	10.75	5.75	10.75
TEGDMA	0	2	2	2	2	2	2	2	2	2
CGI 819	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

	31	32	33	34	35	36	37	38	39	40
Property										
% H_2O	46.4 (0.2)	53.9 (0.7)	51.8 (0.1)	NT	54.1 (0.2)	55.6 (0.1)	53.5 (0.1)	43.6 (0.7)	57.5(0.2)	57.3 (0.1)
HO:Si	0.11	0.25	0.36	0.20	0.30	0.34	0.45	?	0.11	0.20
% Haze	260 (10)	193 (21)	12 (0)	NT	22 (1)	163 (6)	12 (1)	64 (9)	259(36)	22 (0)
DCA	75 (16)	55 (4)	52 (2)	NT	50 (5)	58 (1)	56 (3)	NT	63(9)	NT
Dk	NT	NT	62	NT	88	NT	73	NT	NT	84

Table 10

Comp.	Ex49	Ex50	Ex51	Ex52	Ex53	Ex 54	Ex 55	Ex 56	Ex 57	Ex 58
mPDMS 1000	29.5	35.5	38.5	41.5	44.5	20.5	25.5	29.5	38.5	41.5
NVP	60.5	54.5	51.5	48.5	45.5	69.5	64.75	59.75	50.75	47.75
GMA	6.75	6.75	6.75	6.75	6.75	5.75	5.75	6.75	6.75	6.75
TEGDMA	1	1	1	1	1	2	1.75	1.75	1.75	1.75
Norbloc	2	2	2	2	2	2	2	2	2	2
CGI 819	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

Table 14

Ex.#	[mPDMS] %	[HEMA] %	[NVP] %	HO:Si	% H_2O	% Haze	DCA	Mechanicals		Dk
								Mod. (psi)	Elong. (%)	
59	20.5	10.75	65.5	0.36	70.5 (0.2)	4 (1)	55 (6)	51.0 (6.3)	208.7 (37.5)	48.9
60	20.5	5.75	70.5	0.19	78.1(0.1)	6(0)	50(6)	30.8(2.6)	224.9(29.6)	58.1
61	29.5	10.75	56.5	0.25	65.2 (0.2)	7 (0)	56 (4)	59.1 (1.8)	204.6 (21.4)	63.6
62	35.5	10.75	50.5	0.21	63.2 (0.3)	7 (0)	53 (4)	64.3 (3.2)	208.4 (34.3)	75.0
63	38.5	10.75	47.5	0.19	59.0 (0.1)	9 (1)	54 (3)	70.1 (5.1)	245.0 (62.1)	91.0
64	41.5	10.75	44.5	0.18	NT	NT	NT	NT	NT	NT
65	44.5	10.75	41.5	0.17	52.2 (0.3)	9 (0)	56 (5)	93.7 (5.6)	162.9 (22.4)	114.2
66	47.5	10.75	38.5	0.16	51.6 (0.3)	9 (1)	63 (7)	89.5 (5.3)	163.2 (56.1)	118.4
67	50.5	10.75	35.5	0.15	47.0 (0.4)	10 (1)	119 (4)	103.7 (7.3)	153.7 (39.7)	134.9

As can be seen from the data in Table 14, the present invention provides a wide range of formulations which produce contact lenses having very low haze. The silicone component, mPDMS could be included in amounts up to about 50 wt% and still produce contact lenses having a desirable balance of water content, advancing contact angle and oxygen permeability. The properties of the lenses of Example 64 were not tested. All the formulations had HO:Si within the ranges of the present invention.

Examples 68-73

A reaction mixture was formed by mixing the components listed in Table 15 and degassed by applying vacuum at ambient temperature for about 17(±3) minutes. The amounts of the reaction components are listed as the weight % of reaction components, without diluent. The reaction mixture was mixed with the diluents listed in Table 16 to form the reaction mixtures. The reaction mixture (75 μL) was then dosed at room temperature and <0.1% O_2, into thermoplastic contact lens molds (FC – Zeonor, BC Polypropylene) which had been degassed in N_2 box at RT (Compartment 1, Figure 1) for a minimum of 12 hours prior to dosing. The BC was placed on the FC mold to produce 8 BC/FC assemblies in a pallet. Eight pallets were prepared, moved into the cure compartment (Compartment 2) and placed on a mirrored surface. A quartz plate (12.50 mm x 6.25 mm x 0.50 mm) was placed over each pallet and the lenses were and cured for 20 minutes, at an intensity of 4 – 5 mW/cm^2, <0.1% O_2, and 62-65°C.

The molds for all the lenses were manually demolded (lenses remained in FC). The lenses were dry released by pressing on the back of the front curve. Lenses were extracted in DI water

All lenses were stored in borate buffered packing solution in lens vials and sterilized at 122°C for 30 minutes. The properties of the lenses are shown in Table 17.

Table 15

Base Formulation