CHAPTER 5

RESULTS AND DISCUSSIONS

Discussion on the Results of 150 SN

Base oil 150 SN was processed through the bauxite column at the condition mentioned in Chapter 4. The physical and chemical properties were determined on the oil samples before and after percolation process. The results are shown in Table 5.1. Fig. 5.1 and Fig.5.2 show the decreasing in air release value and sulphur content towards the contact time for samples from both different operating temperture , 60 °C. and 100 °C. but more significant at 100 °C. .

Viscosity at 40 °C. and 100 °C. and Viscosity index of oils (Fig. 5.3) did not change or intend to decrease or increase very much. Viscosity of oil at operating temperature of 100 °C. were a little lower than those of 60 °C. process.

Aromatic content and Paraffinic content of oils from process at 100 °C. were a little higher than those from 60 °C. Napthenic content were about the same for both cases.

Color of oils (Fig. 5.5) were significant improved for oils from process at 60 °C. but slighly improved for those from 100 °C. process.

Table 5.1 Physical and Chemical Properties of Base Oil 150SN before and after Percolation Process at 60 C. and 100 C. .

Sample Code (oil-temp-contact time)	Colour	Sulphur content,%	KV 40 C.	KV 100 C.	KVI	%Ca	%Cp	%Cn	Air release value ,min.
150-60c.-0m.	1.0	0.46	33.52	5.37	97	4.68	63.1	32.22	3
150-60c.-20m.	0.5	0.453	33.6	5.51	99	4.69	62.85	32.46	3
150-60c.-40m.	0.5	0.445	32.77	5.41	98	4.7	62.97	32.33	2.9
150-60c.-60m.	0.5	0.431	33.24	5.49	100	4.65	63	32.35	2.8
150-60c.-80m.	0.5	0.425	33.62	5.46	96	4.69	63.11	32.21	2.8
150-60c.-100m.	0.5	0.412	33.56	5.49	98	4.73	63.15	32.11	2.6
150-60c.-120m.	0.5	0.404	32.99	5.42	97	4.72	63.21	32.07	2.5
150-100c.-0m.	L 1.0	0.46	32.52	5.37	97	4.68	63.1	32.22	3
150-100c.-20m.	L 1.0	0.451	32.51	5.4	98	4.73	63.21	32.06	2.8
150-100c.-40m.	L 1.0	0.44	32.97	5.4	96	4.83	63.11	32.05	2.7
150-100c.-60m.	L 1.0	0.425	32.82	5.4	97	4.78	63.17	32.05	2.6
150-100c.-80m.	L 1.0	0.409	32.18	5.35	98	4.79	63.25	31.96	2.4
150-100c.-100m.	0.5	0.394	32.39	5.39	99	4.78	63.36	31.87	2.2
150-100c.-120m.	0.5	0.383	31.94	5.35	100	4.8	63.24	31.96	2.2

Fig. 5.1 Air Release Value of 150 SN after percolation process at various contact time and different temperature 60 C. and 100 C.

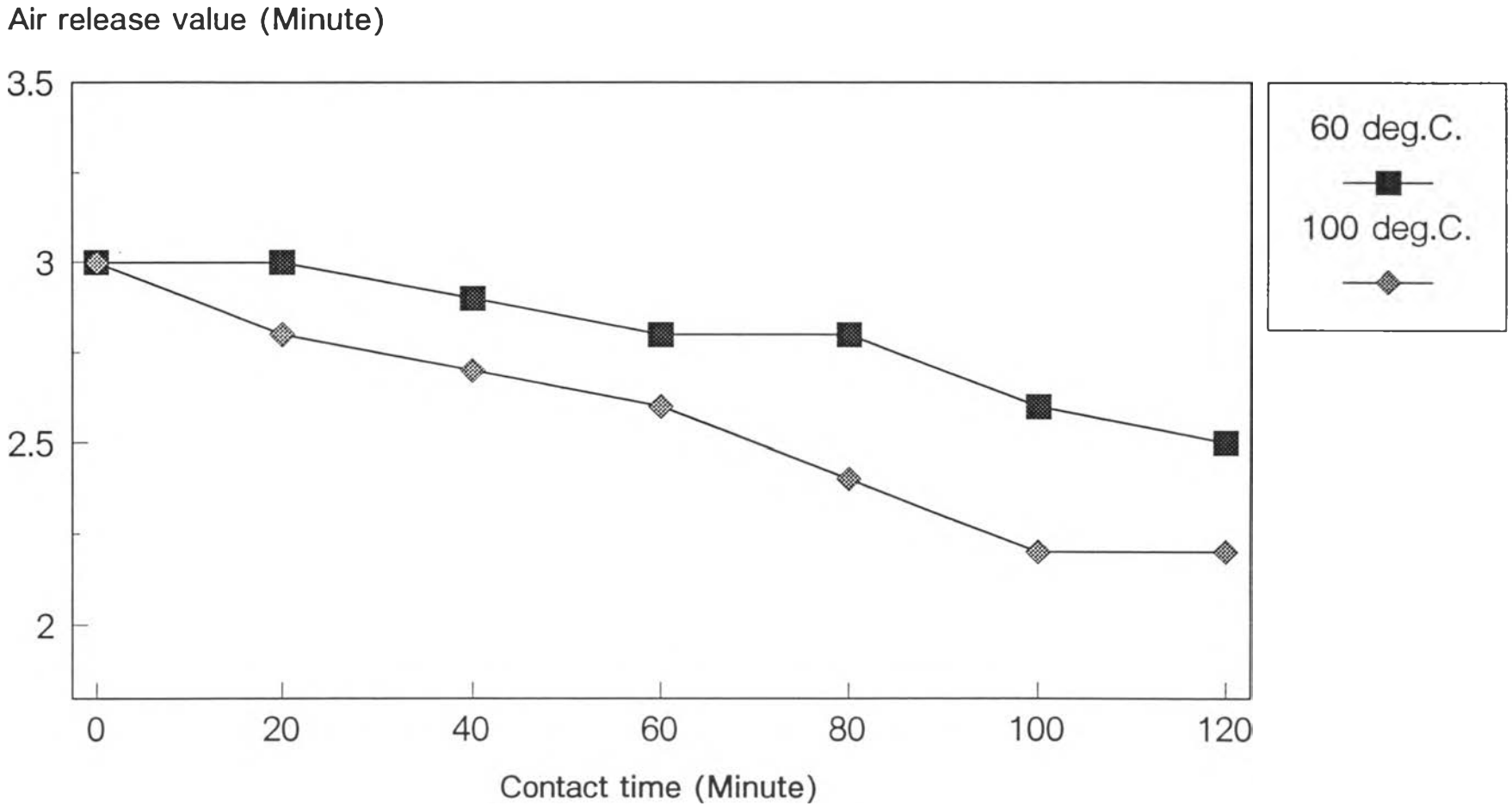


Fig. 5.2 Sulphur content of 150 SN after percolation process at various contact time and different temperature 60 C. and 100 C.

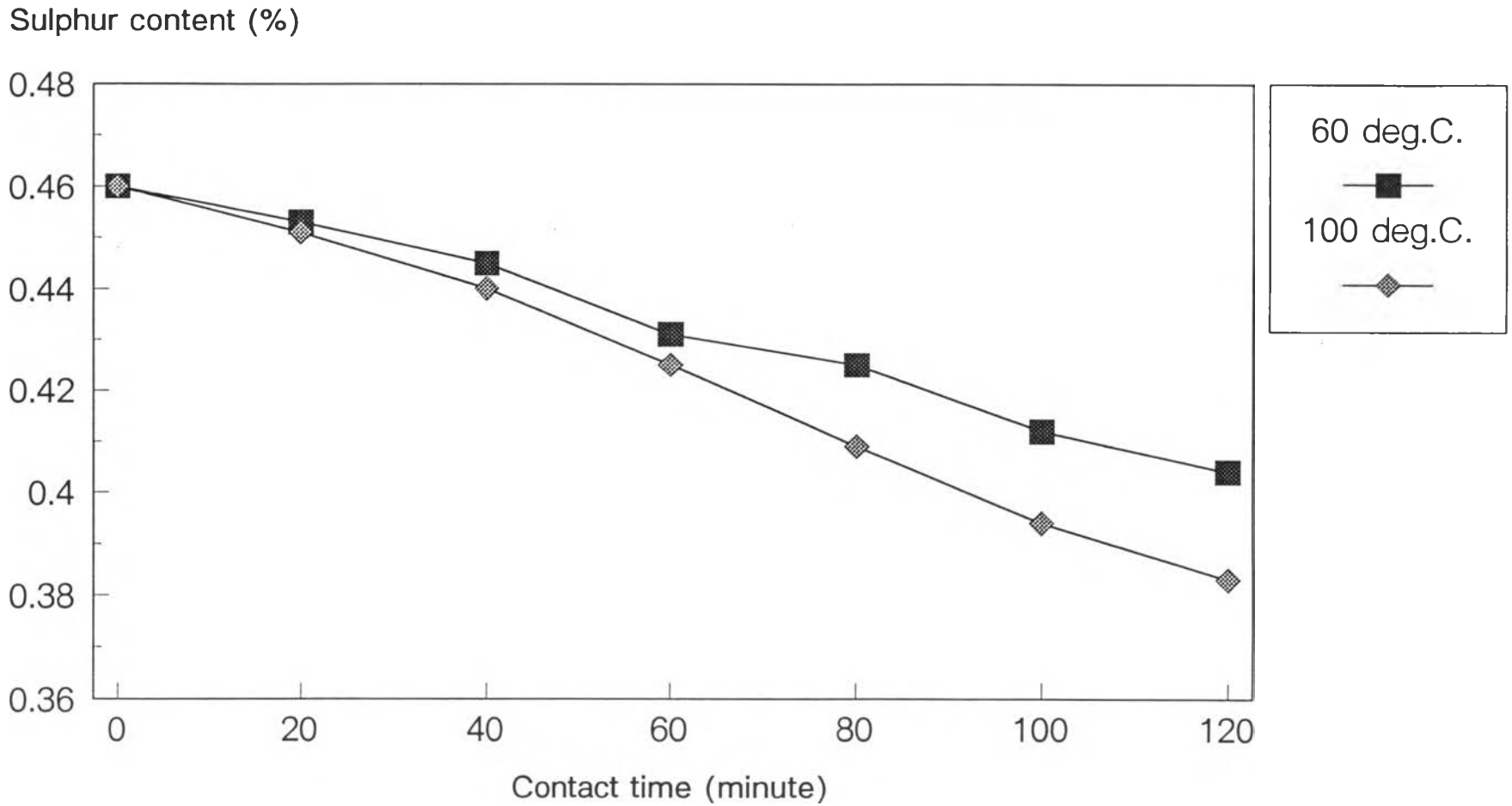


Fig. 5.3 Viscosity and Viscosity index of 150 SN after percolation process at various contact time and different temperature 60 C. and 100 C.

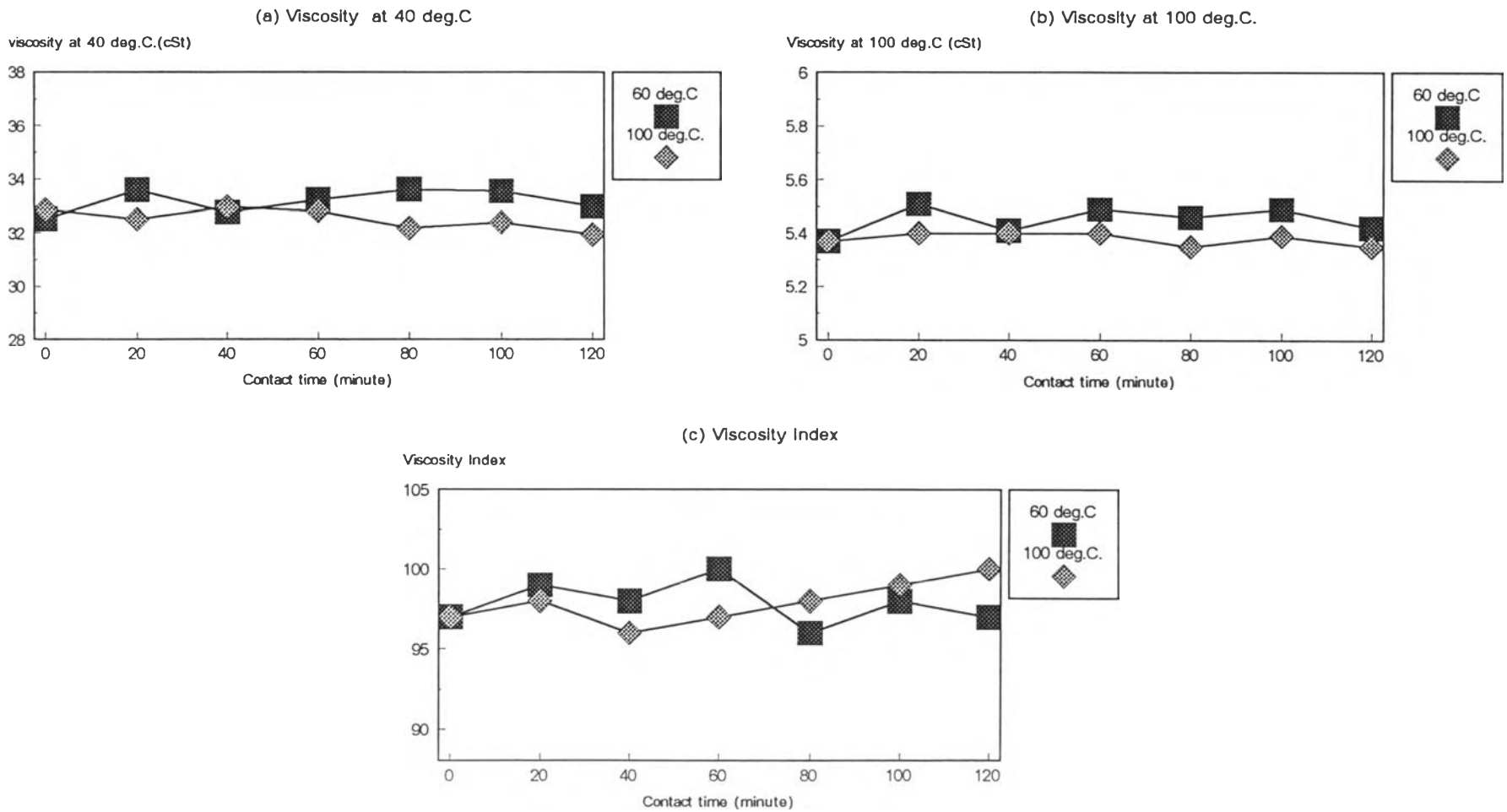


Fig. 5.4 Compositions of 150 SN after percolation process at various contact time and different temperature 60 C. and 100 C.

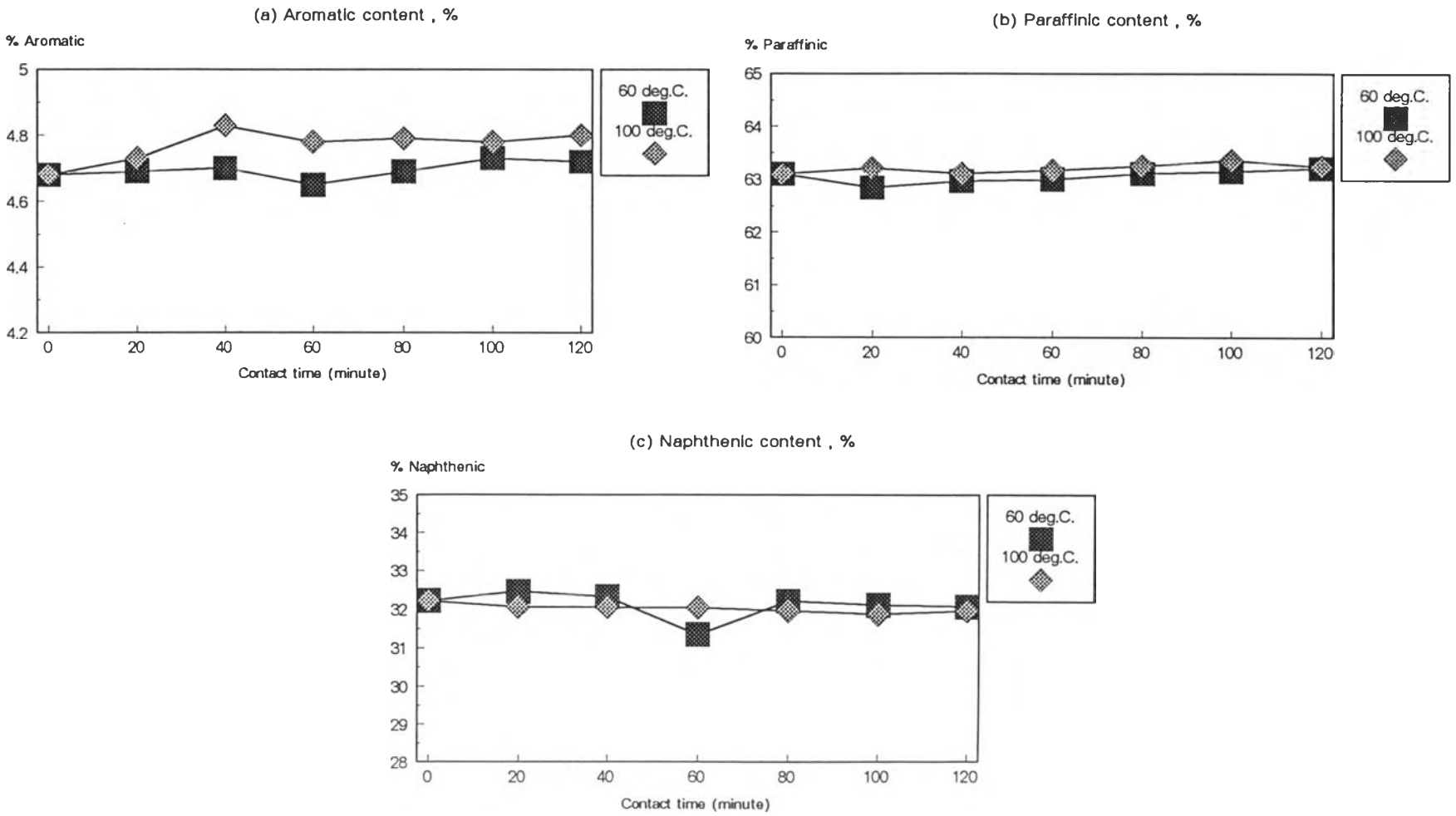
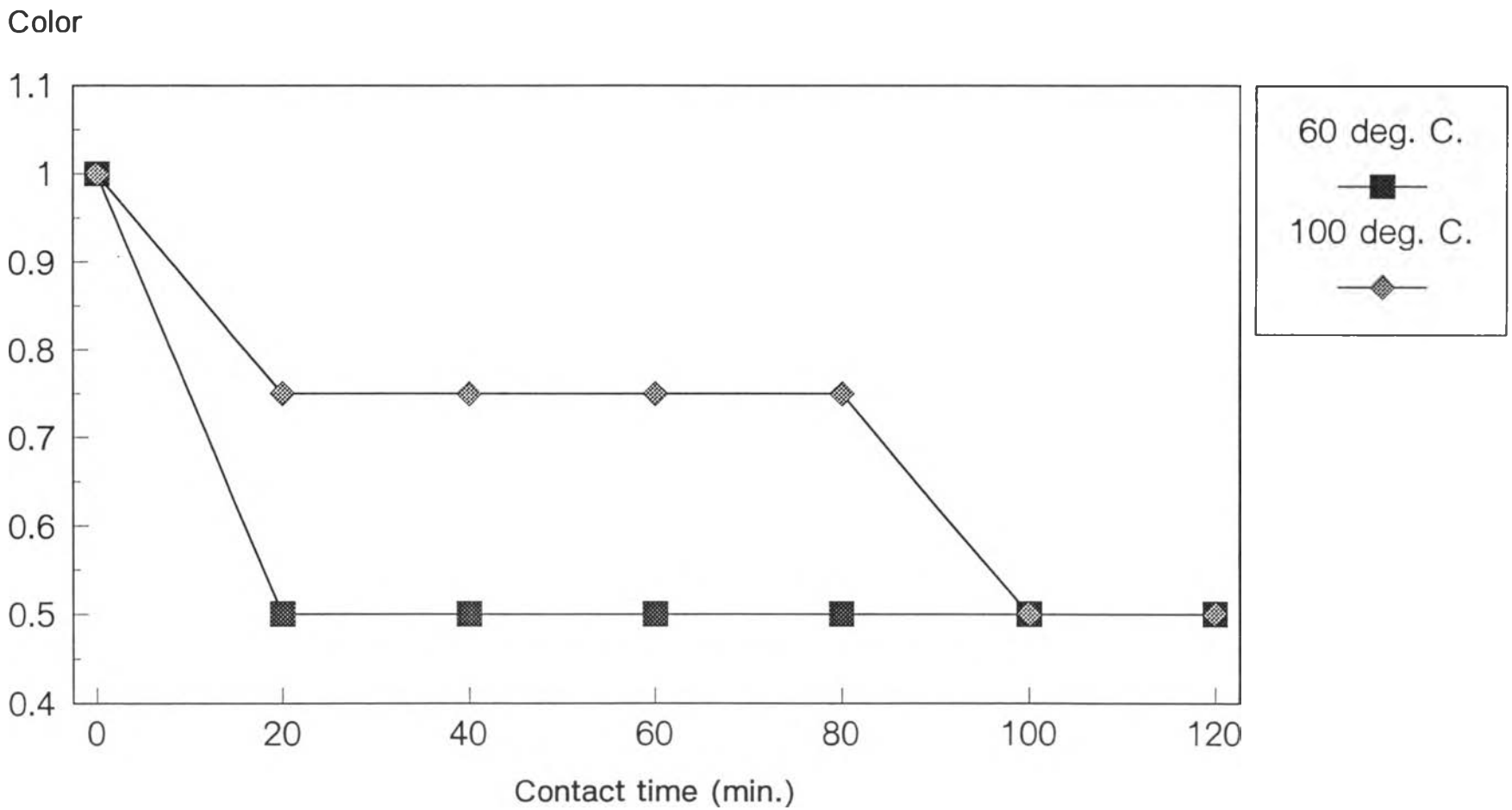


Fig. 5.5 Color of 150 SN after percolation process at various contact time anddifferentemperature 60 C. and 100 C.



Discussion on the Results of 450 SN

Base oil 450 SN was processed through the bauxite column at the condition mentioned in Chapter 4. The physical and chemical properties were determined on the oil samples before and after percolation process. The results are shown in Table 5.2. Fig. 5.6 and Fig. 5.7 show the decreasing in air release value and sulphur content towards the contact time for samples from both different operating temperture , 60 °C. and 100 °C. but more significant at 100 °C. .

Viscosity at 40 °C. and 100 °C. of oils (Fig. 5.8) were not different very much while Viscosity index intended to decrease towards the contact time for both cases.

Aromatic content and Paraffinic content of oils (Fig. 5.9) from both process at 40°C. and 100 °C. decreased toward the longer contact time but not significantly while Napthenic content intend to decrease..

Color of oils (Fig. 5.10) were about the same initially but those from process at improved for oils from process at 60 °C. became lighter at the contact time of 120 minute.

Table 5.2 Physical and Chemical Properties of Base Oil 450SN before and after Percolation Process at 60 C. and 100 C. .

Sample Code (oil-temp-contact time)	Colour	Sulphur content,%	KV 40 C.	KV 100 C.	KVI	%Ca	%Cp	%Cn	Air release value ,min.
450-60c.-0m.	2.0	0.553	89.15	10.46	100	6.13	64.30	29.57	8.0
450-60c.-20m.	L 2.0	0.541	90.32	10.54	99	6.12	64.25	29.63	7.7
450-60c.-40m.	L 2.0	0.533	89.11	10.43	98	6.15	64.38	29.48	7.4
450-60c.-60m.	L 2.0	0.521	89.41	10.54	100	6.13	64.47	29.4	7.0
450-60c.-80m.	L 2.0	0.509	89.88	10.48	98	6.17	64.48	29.35	6.7
450-60c.-100m.	L 2.0	0.493	89.09	10.24	95	6.22	64.54	29.24	6.4
450-60c.-120m.	1.5	0.478	89.34	10.35	97	6.17	64.49	29.34	6.3
450-100c.-0m.	2.0	0.553	89.15	10.46	100	6.13	64.30	29.57	8.0
450-100c.-20m.	2.0	0.538	89.49	10.55	100	6.14	64.31	29.55	7.6
450-100c.-40m.	L 2.0	0.526	89.97	10.45	98	6.13	64.34	29.53	7.2
450-100c.-60m.	L 2.0	0.51	89.96	10.60	100	6.18	64.29	29.53	6.7
450-100c.-80m.	L 2.0	0.489	89.22	10.45	98	6.17	64.36	29.47	6.4
450-100c.-100m.	L 2.0	0.472	89.67	10.47	98	6.2	64.35	29.45	6.1
450-100c.-120m.	L 2.0	0.46	89.46	10.39	97	6.22	64.38	29.4	5.9

Fig. 5.6 Air Release Value of 450 SN after percolation process at various contact time and different temperature , 60 C. and 100 C. .

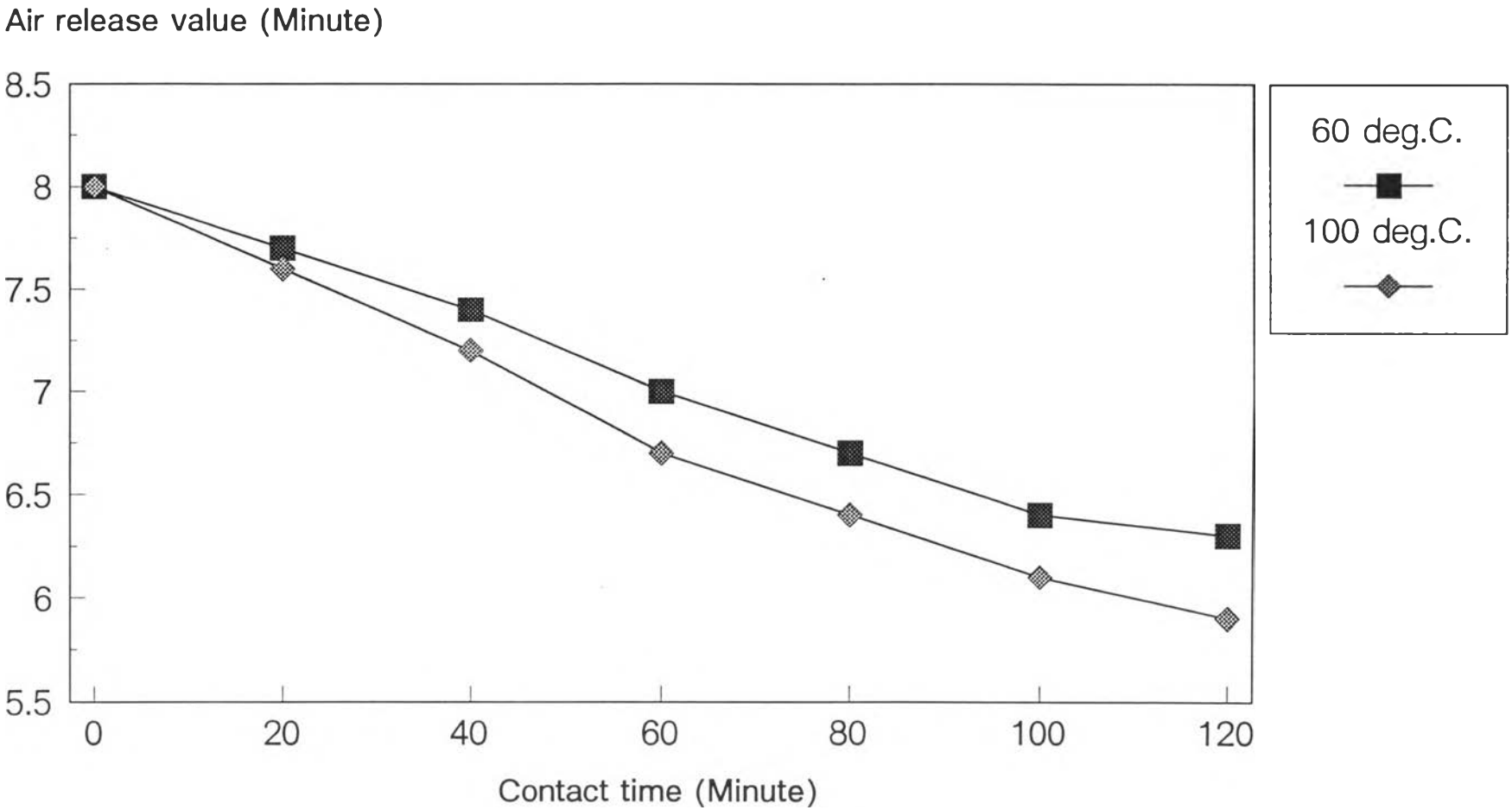


Fig. 5.7 Sulphur content of 450 SN after percolation process at various contact time and different temperature , 60 C. and 100 C. .

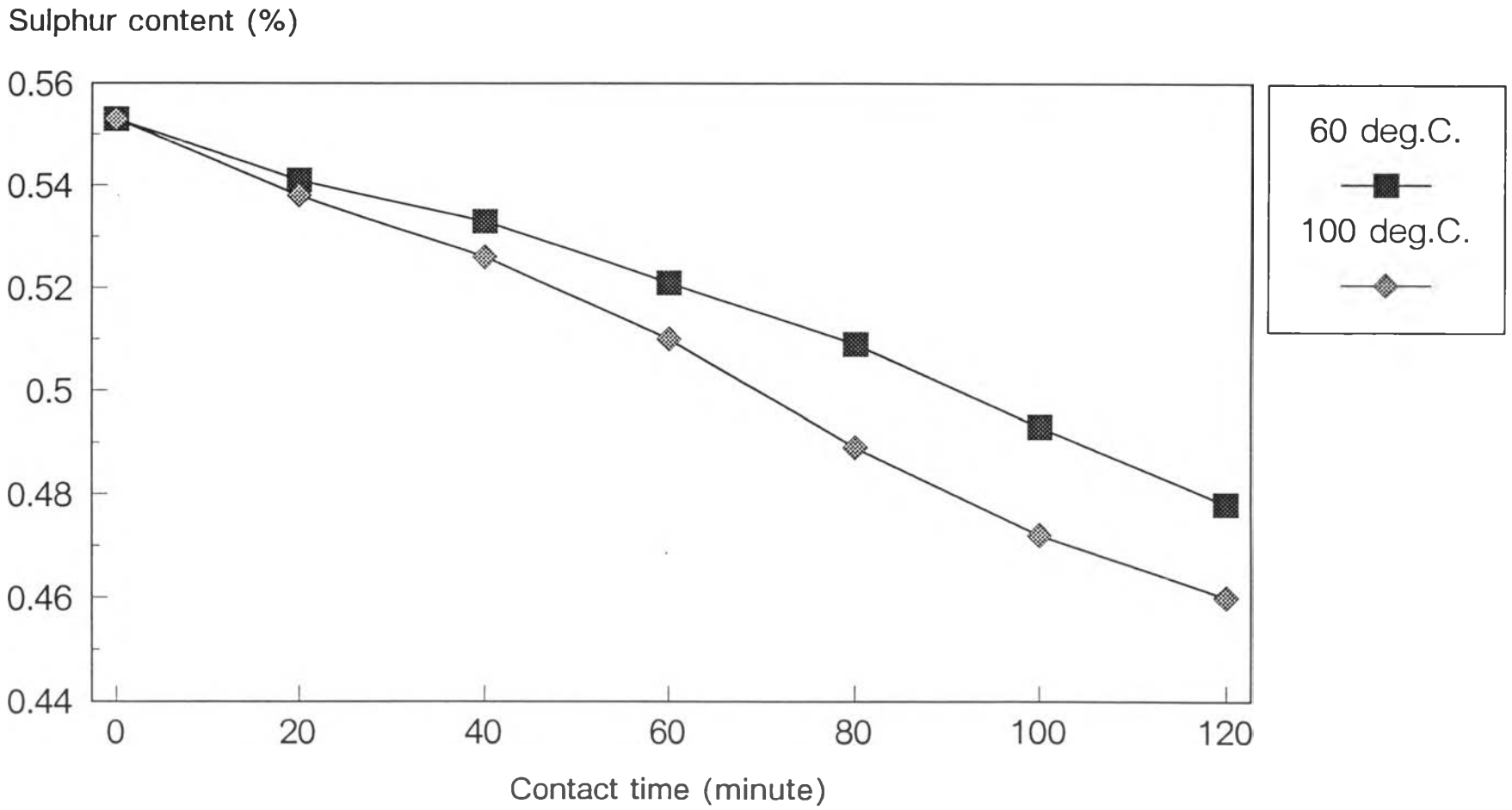


Fig. 5.8 Viscosity and Viscosity index of 450 SN after percolation process at various contact time and different temperature , 60 C. and 100 C. .

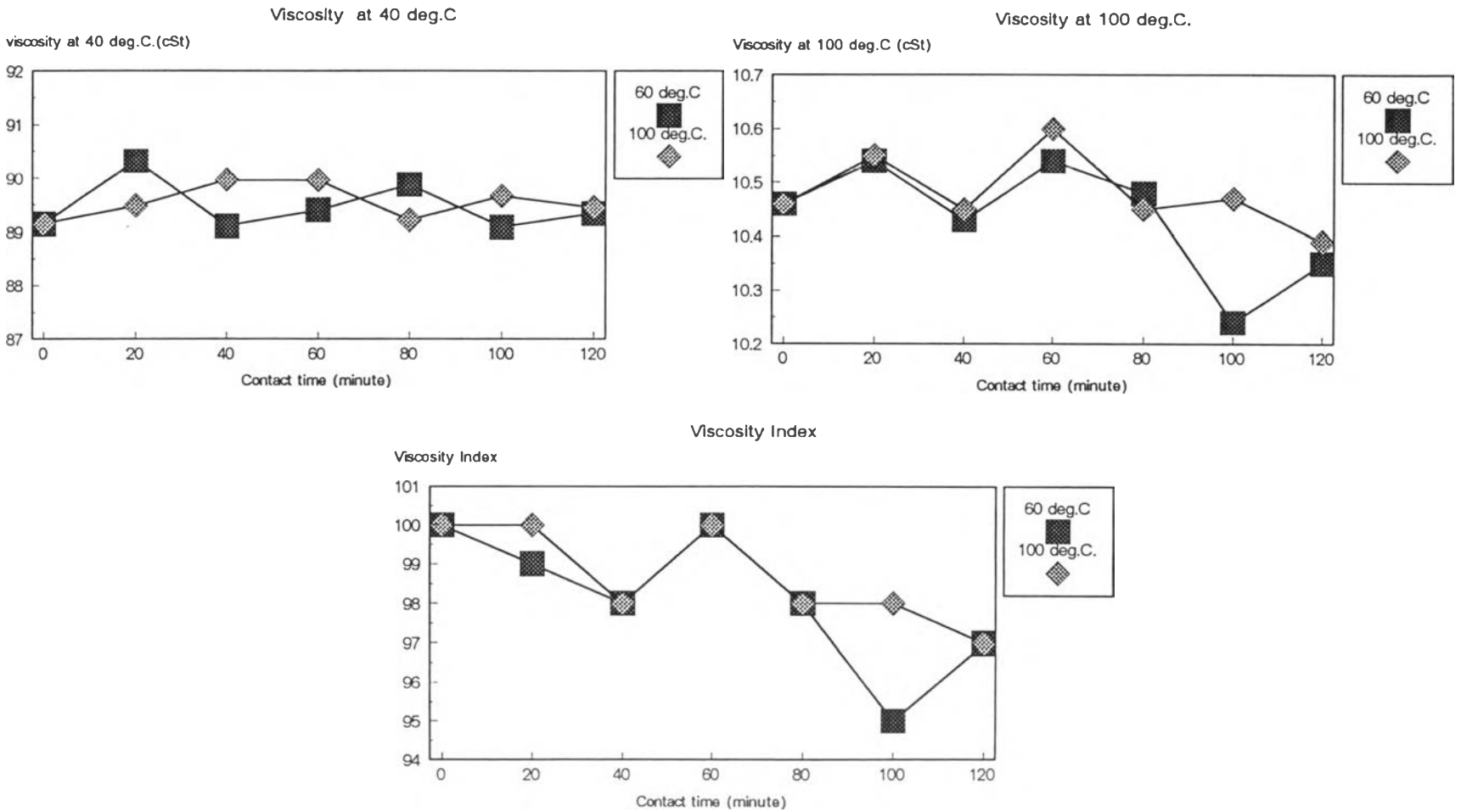


Fig. 5.9 Compositions of 450 SN after percolation process at various contact time and different temperature , 60 C. and 100 C. .

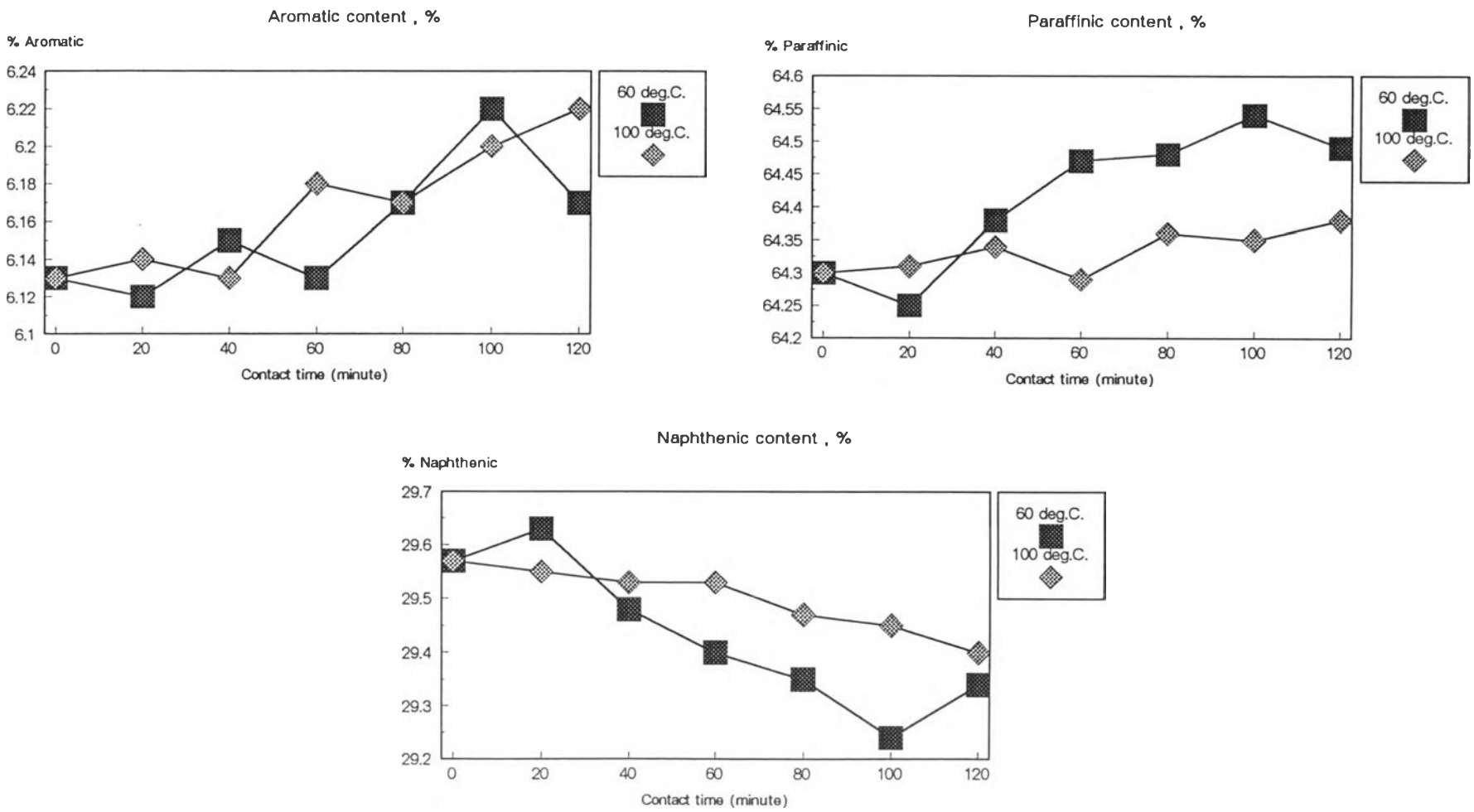
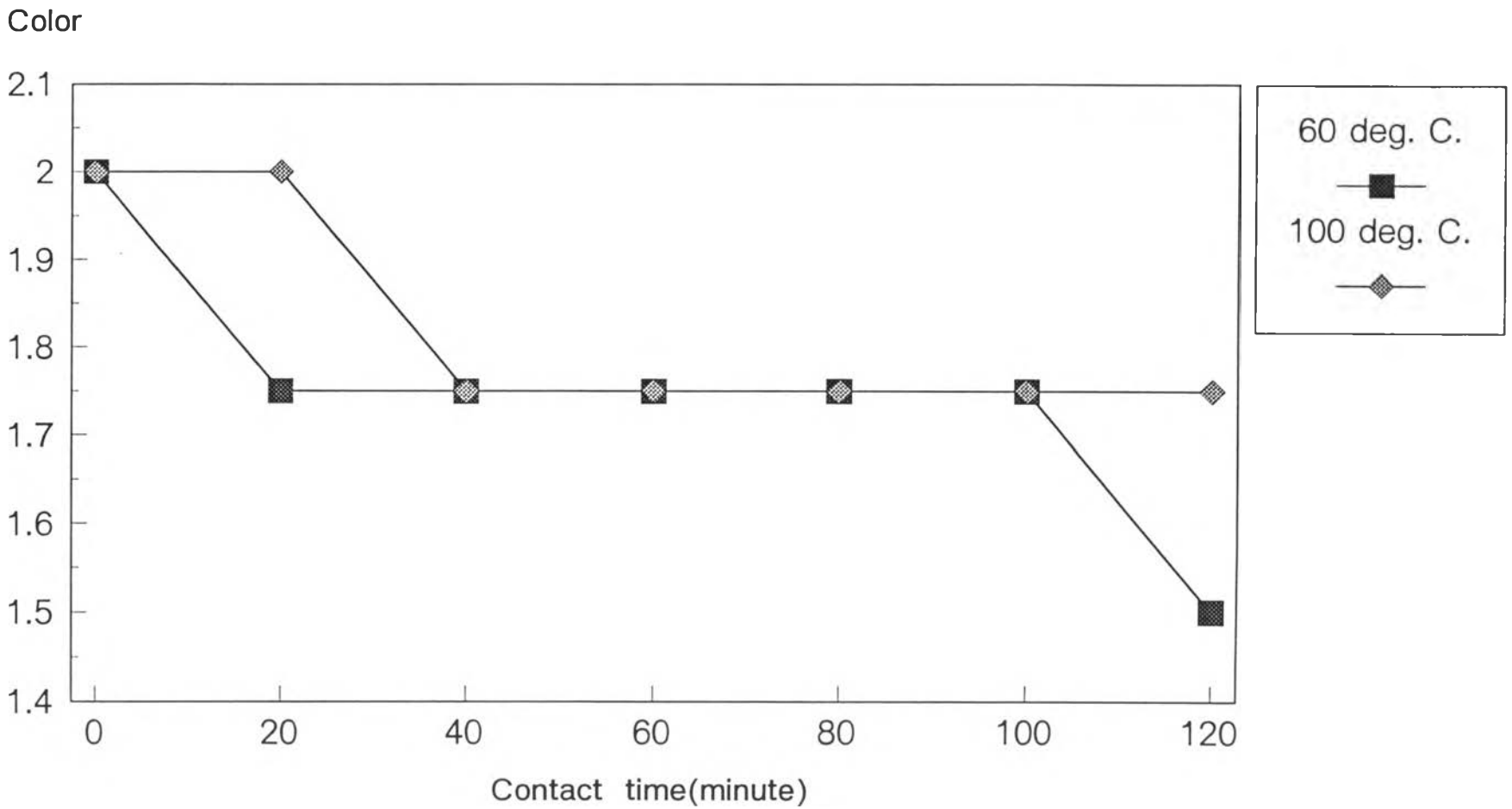


Fig. 5.10 color of 450 SN after percolation process at various contact time and different temperature , 60 C. and 100 C. .



Discussion on the Results of 500 SN

Base oil 500 SN was processed through the bauxite column at the condition mentioned in Chapter 4. The physical and chemical properties were determined on the oil samples before and after percolation process. The results are shown in Table 5.3. Fig. 5.11 an Fig. 5.12 show the decreasing in air release value and sulphur content towards the contact time for samples from both different operating temperture , 60 °C. and 100 °C. but more significant at 100 °C. .

Viscosity at 40 °C. and 100 °C. and Viscosity index of oils (Fig. 5.13) did not change very much for both cases.

Aromatic content slightly increased while Paraffinic content and Naphthenic content of oils (Fig. 5.14) did not change change very much.

Color of oils (Fig. 5.10) were about the same initially but those from process at improved for oils from process at 60 °C. became lighter at the contact time of 120 minute.

Table 5.3 Physical and Chemical Properties of Base Oil 500SN before and after Percolation Process at 60 C. and 100 C. .

Sample Code (oil-temp-contact time)	Colour	Sulphur content,%	KV 40 C.	KV 100 C.	KVI	%Ca	%Cp	%Cn	Air release value ,min.
500-60c.-0m.	L 3.0	0.288	96.87	10.91	96	6.62	68.95	24.43	6.3
500-60c.-20m.	L 2.5	0.275	97.5	11.04	98	6.73	68.98	24.29	6.3
500-60c.-40m.	L 2.5	0.263	96.35	10.94	97	6.69	69.25	24.06	6.1
500-60c.-60m.	L 2.5	0.254	91.9	10.62	98	6.65	69.31	24.04	5.9
500-60c.-80m.	L 2.5	0.24	96.2	10.86	96	9.81	69.10	24.09	5.7
500-60c.-100m.	L 2.5	0.231	92.88	10.64	97	6.90	68.98	24.12	5.6
500-60c.-120m.	2.0	0.223	97.27	10.85	95	6.92	69.05	24.03	5.6
500-100c.-0m.	L 3.0	0.288	96.87	10.91	96	6.62	68.95	24.43	6.3
500-100c.-20m.	L 2.5	0.273	94.60	10.67	95	6.69	69.09	24.22	6.1
500-100c.-40m.	L 2.5	0.26	96.57	10.86	96	6.62	69.28	24.10	5.9
500-100c.-60m.	L 2.5	0.249	96.13	10.88	97	6.88	69.49	24.63	5.7
500-100c.-80m.	L 2.5	0.238	96.98	10.84	95	6.99	69.17	23.84	5.6
500-100c.-100m.	L 2.5	0.22	96.00	10.89	97	7.02	69.27	23.70	5.5
500-100c.-120m.	L 2.5	0.207	96.39	10.81	95	7.13	69.12	23.75	5.3

Fig. 5.11 Air release value of 500 SN after percolation process at various contact time and different temperature , 60 C and 100 C.

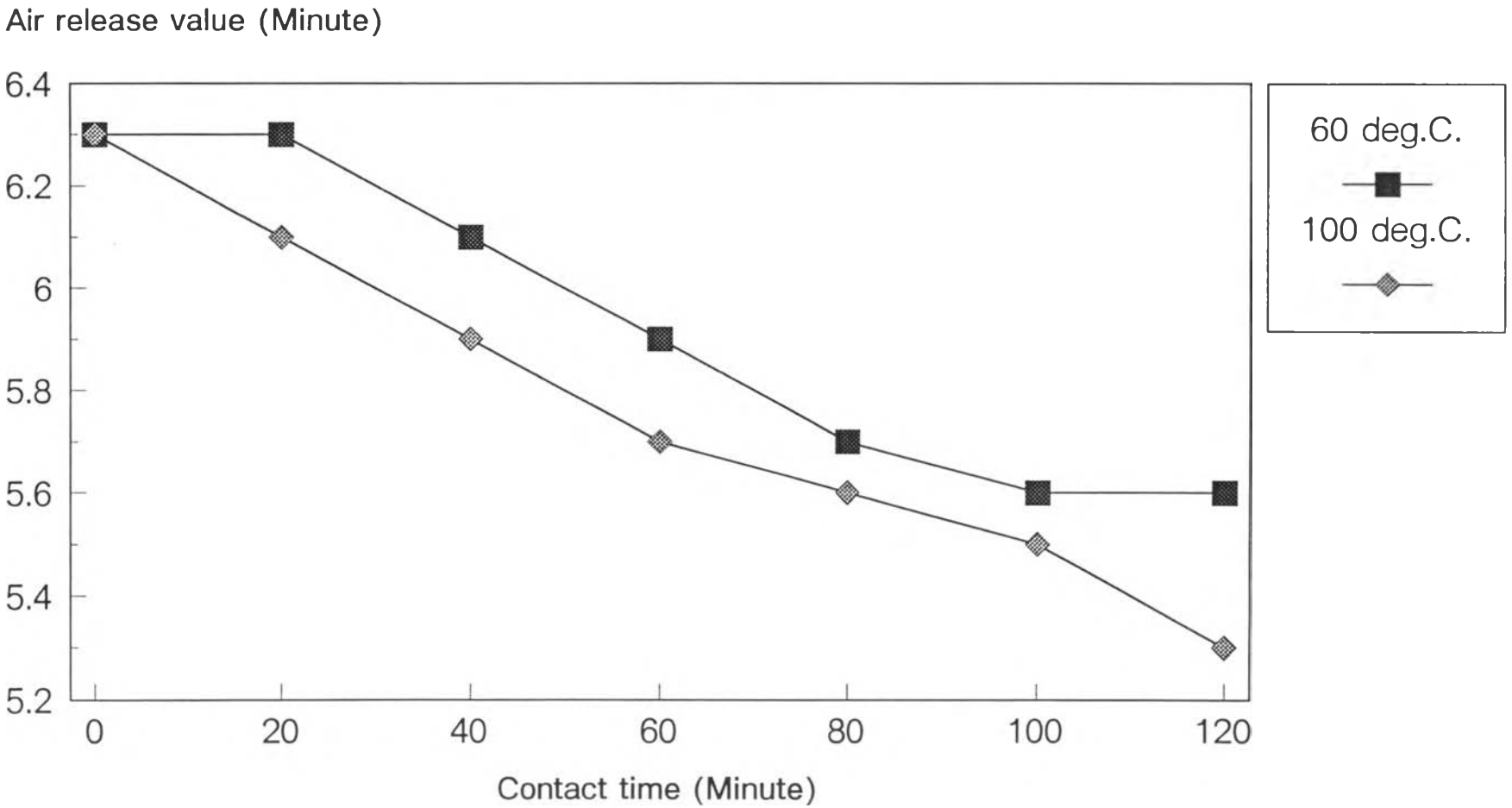


Fig. 5.12 Sulphur content of 500 SN after percolation process at various contact time and different temperature , 60 C and 100 C.

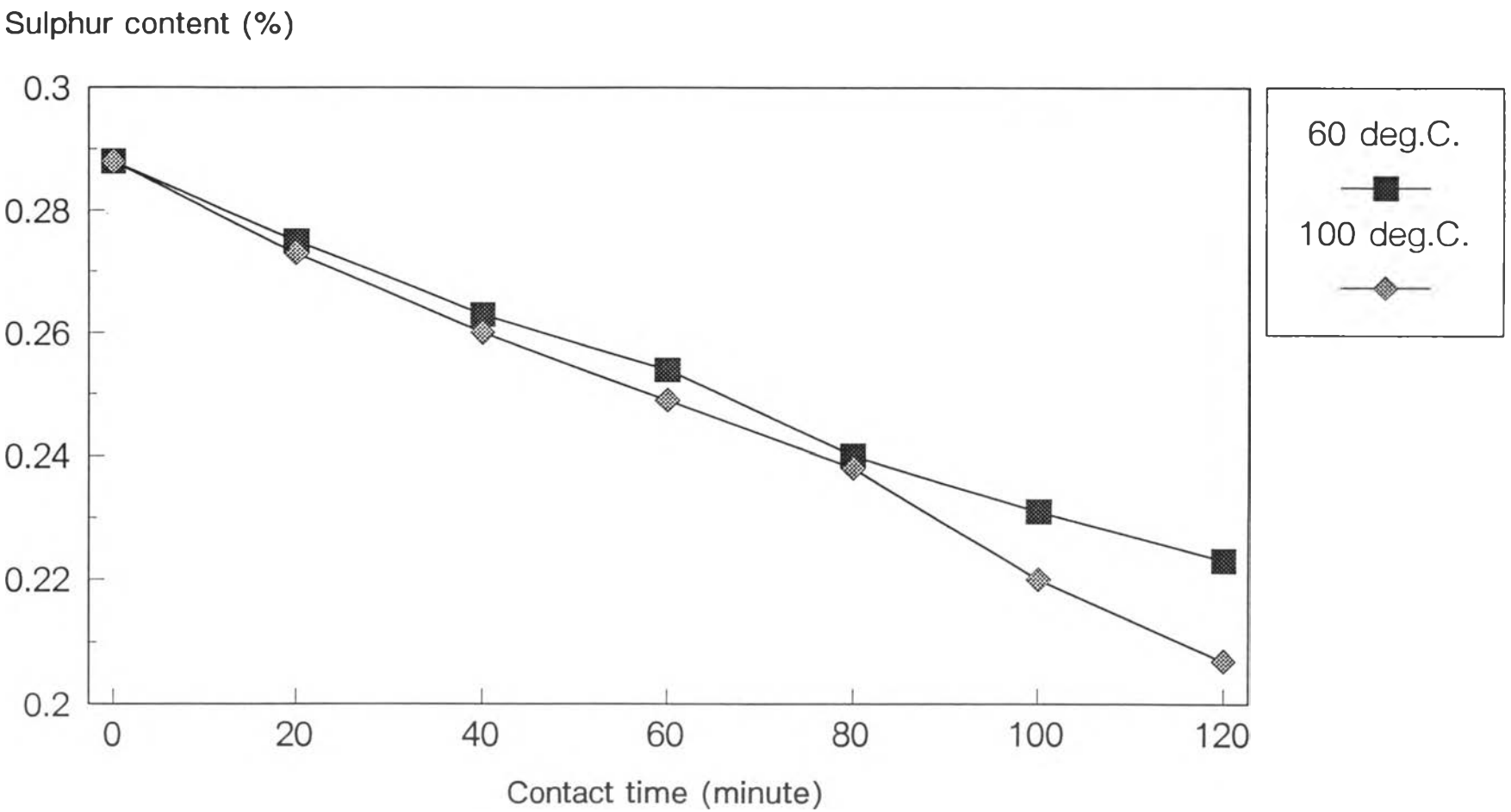


Fig. 5.13 Viscosity and Viscosity index of 500 SN after percolation process at various contact time and different temperature , 60 C and 100 C.

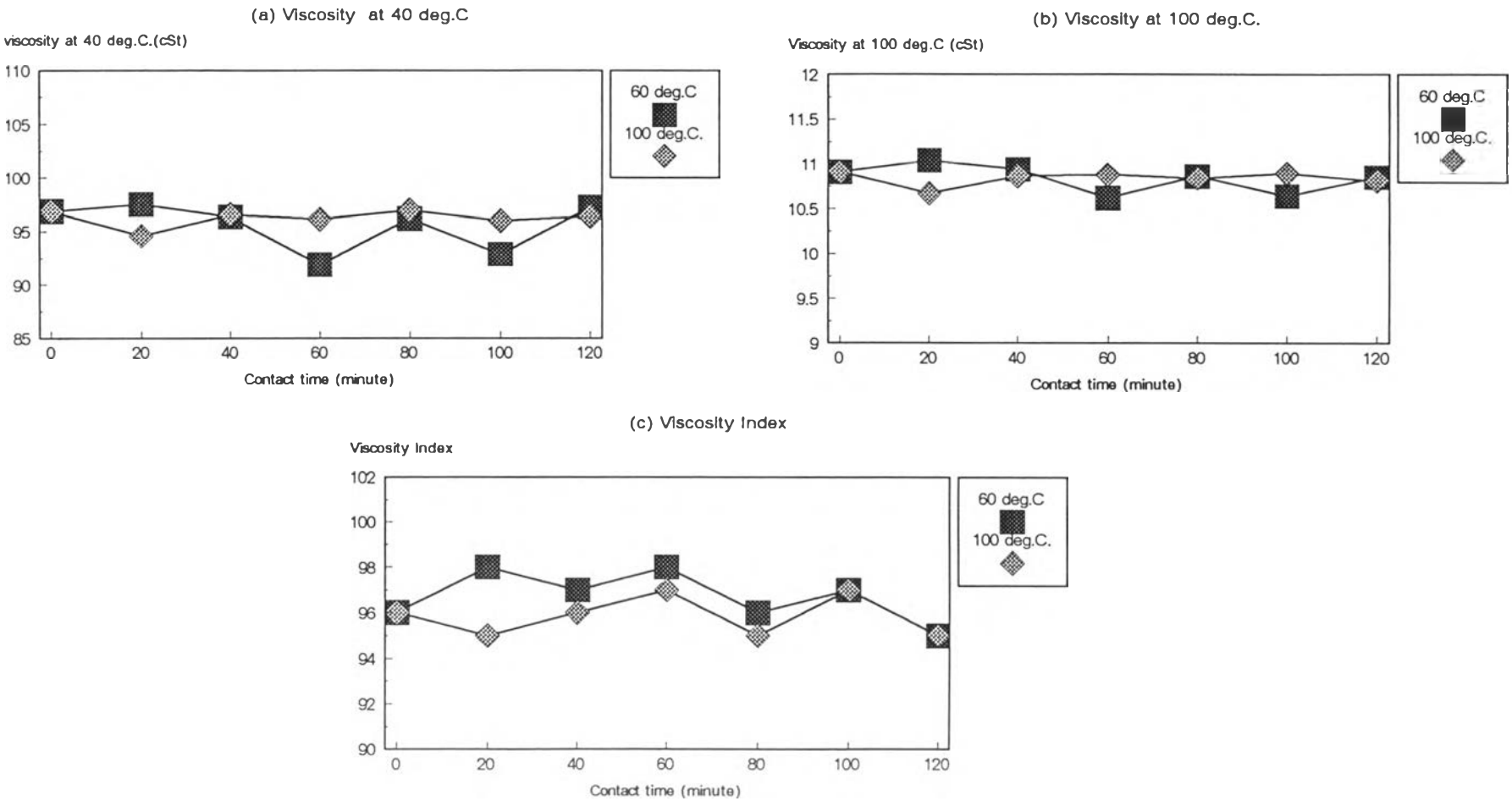


Fig. 5.14 Compositions of 500 SN after percolation process at various contact time and different temperature , 60 C and 100 C.

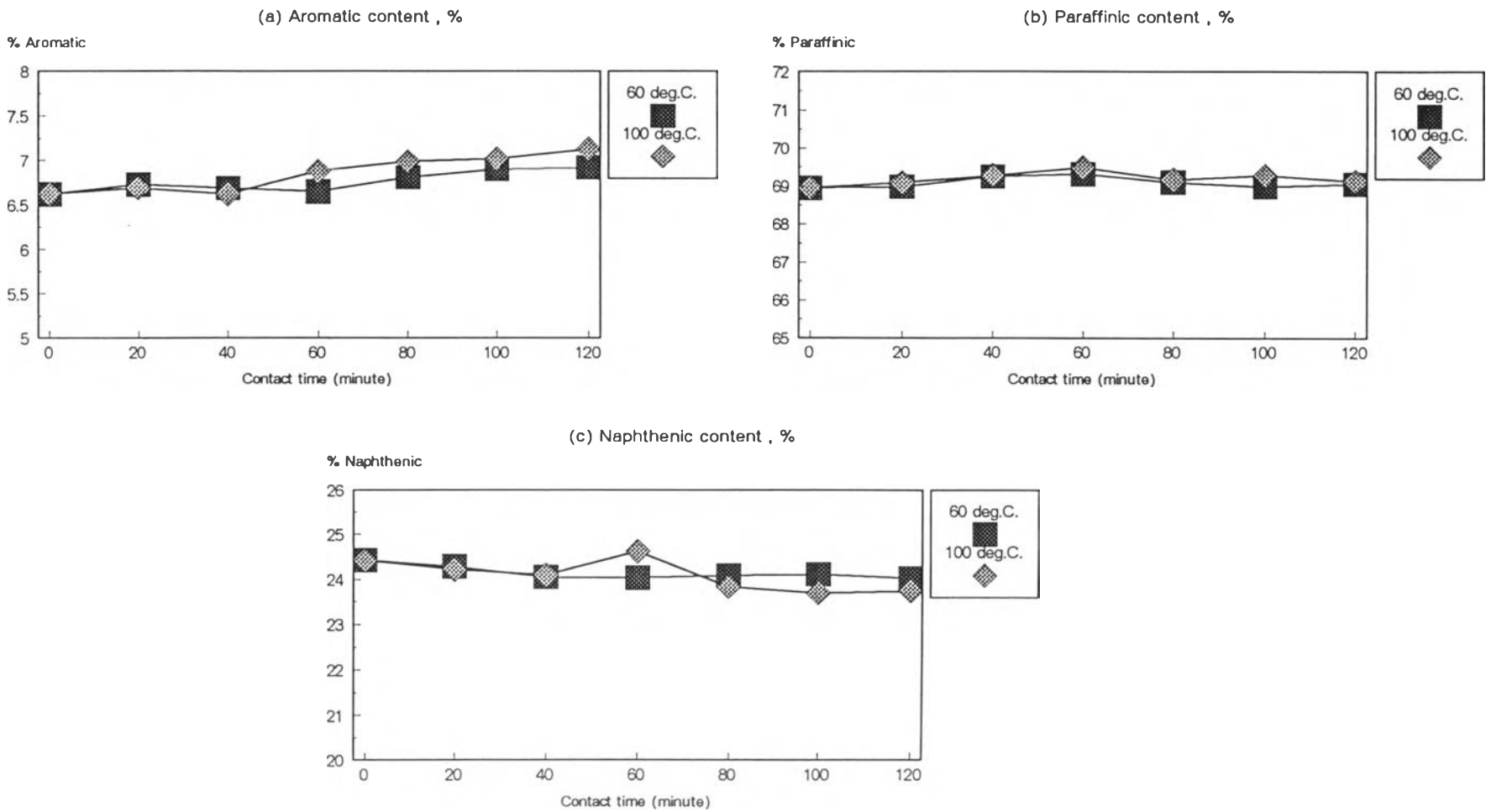
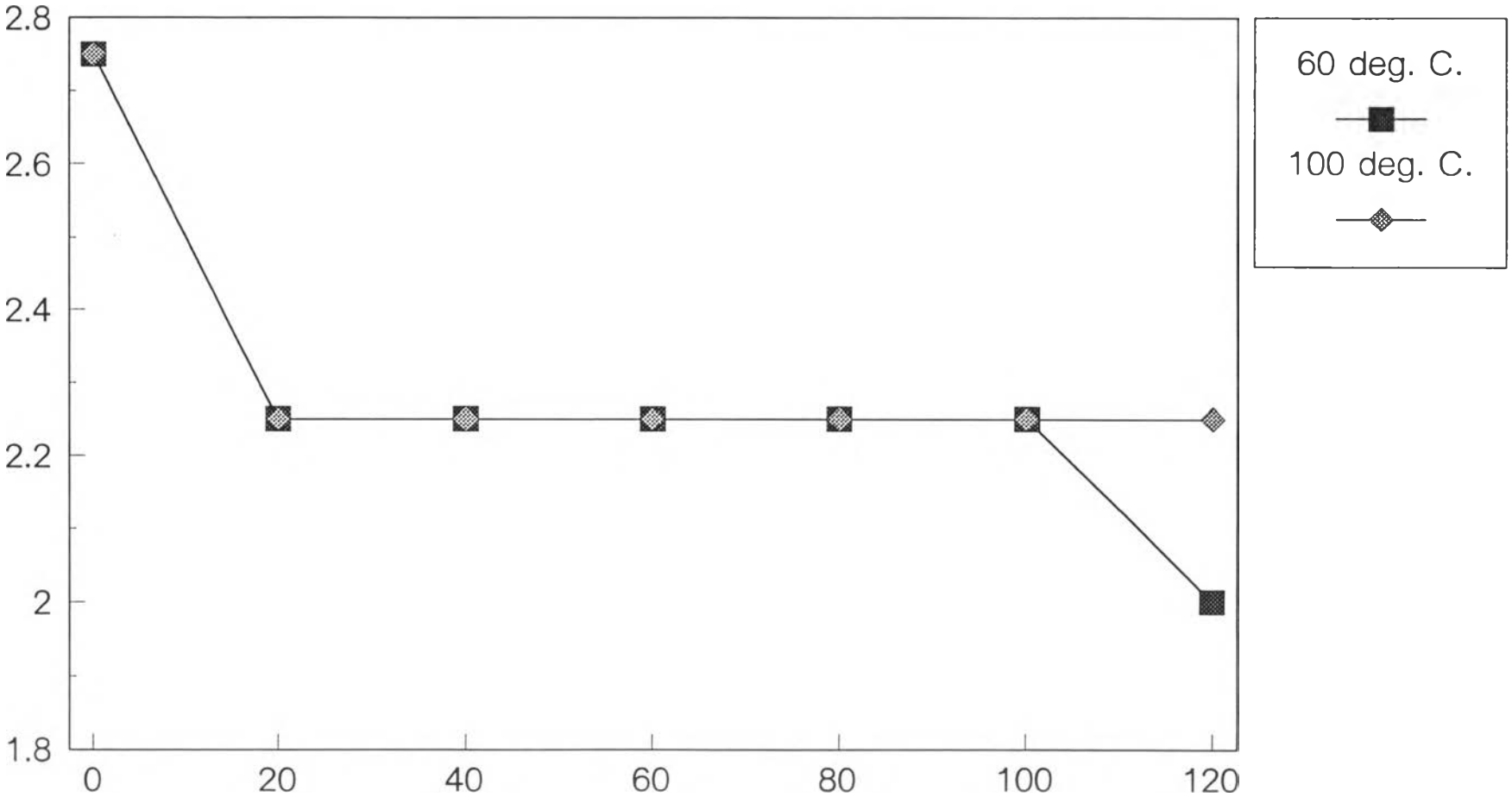


Fig. 5.15 Color of 500 SN after percolation process at various contact time and different temperature , 60 C and 100 C.



Discussion on the Results of 600 SN

Base oil 600 SN was processed through the bauxite column at the condition mentioned in Chapter 4. The physical and chemical properties were determined on the oil samples before and after percolation process. The results are shown in Table 5.4. Fig. 5.16 and Fig. 5.17 show the decreasing in air release value and sulphur content towards the contact time for samples from both different operating temperture , 60 °C. and 100 °C. but more significant at 100 °C. .

Viscosity at 40 °C. and 100 °C. and Viscosity index of oils (Fig. 5.13) were about the same for both cases and did not change very much .

Aromatic content and Paraffinic content slightly increased while Naphthenic content slightly decreased for both cases (Fig.5.19).

Color of oils (Fig. 5.20) from process at 60 °C. decreased from 1.25 to 1.0 at 20 minute of contact time and were conatant through 120 minute while color of those from 100 °C. were constant initially and then decreased to 1.0 at 120 minute of contact time.

Table 5.4 Physical and Chemical Properties of Base Oil 600SN before and after Percolation Process at 60 C. and 100 C. .

Sample Code (oil-temp-contact time)	Colour	Sulphur content,%	KV 40 C.	KV 100 C.	KVI	%Ca	%Cp	%Cn	Air release value ,min.
600-60c.-0m.	L 1.5	0.354	123.7	12.47	95	8.01	66.91	25.08	6.8
600-60c.-20m.	1.0	0.336	114	12.22	97	8.32	66.79	524.9	6.7
600-60c.-40m.	1.0	0.324	114.9	12.10	94	7.74	67.06	25.20	6.6
600-60c.-60m.	1.0	0.311	118.4	12.51	96	7.75	67.32	24.93	6.6
600-60c.-80m.	1.0	0.298	119.9	12.44	94	8.45	67.45	24.10	6.4
600-60c.-100m.	1.0	0.283	119.8	12.45	94	8.94	67.45	23.61	6.3
600-60c.-120m.	1.0	0.271	120.7	12.57	95	8.65	67.43	23.92	6.2
600-100c.-0m.	L 1.5	0.354	123.7	12.47	95	8.01	66.91	25.08	6.8
600-100c.-20m.	L 1.5	0.332	115.60	12.20	96	8.67	67.47	23.86	6.6
600-100c.-40m.	L 1.5	0.319	119.70	12.43	94	9.16	67.50	23.34	6.4
600-100c.-60m.	L 1.5	0.304	119	12.53	96	8.54	67.46	24.00	6.3
600-100c.-80m.	L 1.5	0.289	120.5	12.48	94	8.35	67.58	24.07	6.1
600-100c.-80m.	L 1.5	0.271	120	12.48	94	9.13	67.56	23.31	5.9
600-100c.-120m.	1.0	0.258	118.70	12.43	95	9.46	67.65	22.89	5.9

Fig. 5.16 Air Release Value of 600 SN after percolation process at various contact and different temperature , 60 C. and 100 C. .

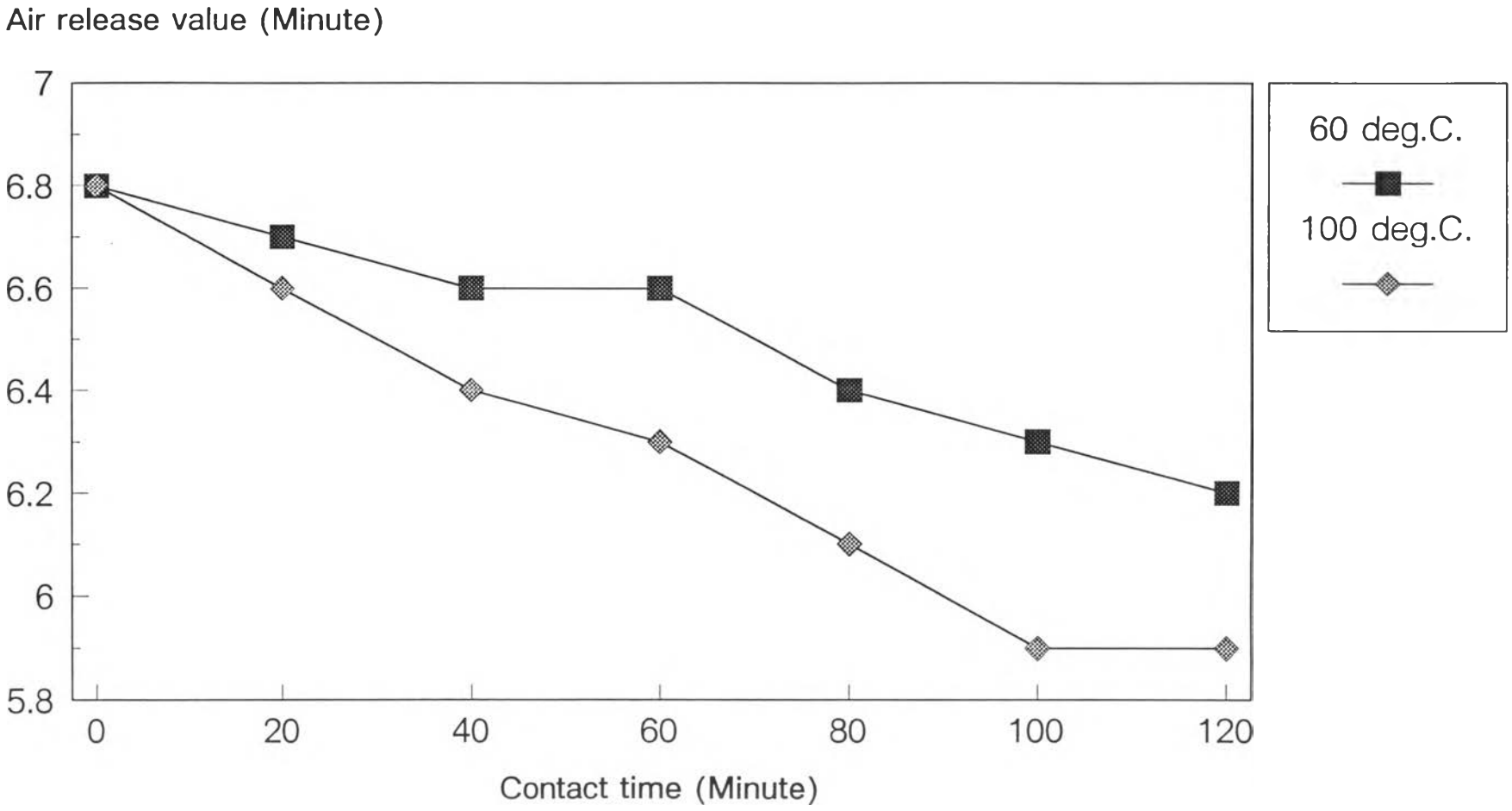


Fig. 5.17 Sulphur content of 600 SN after percolation process at various contact and different temperature , 60 C. and 100 C. .

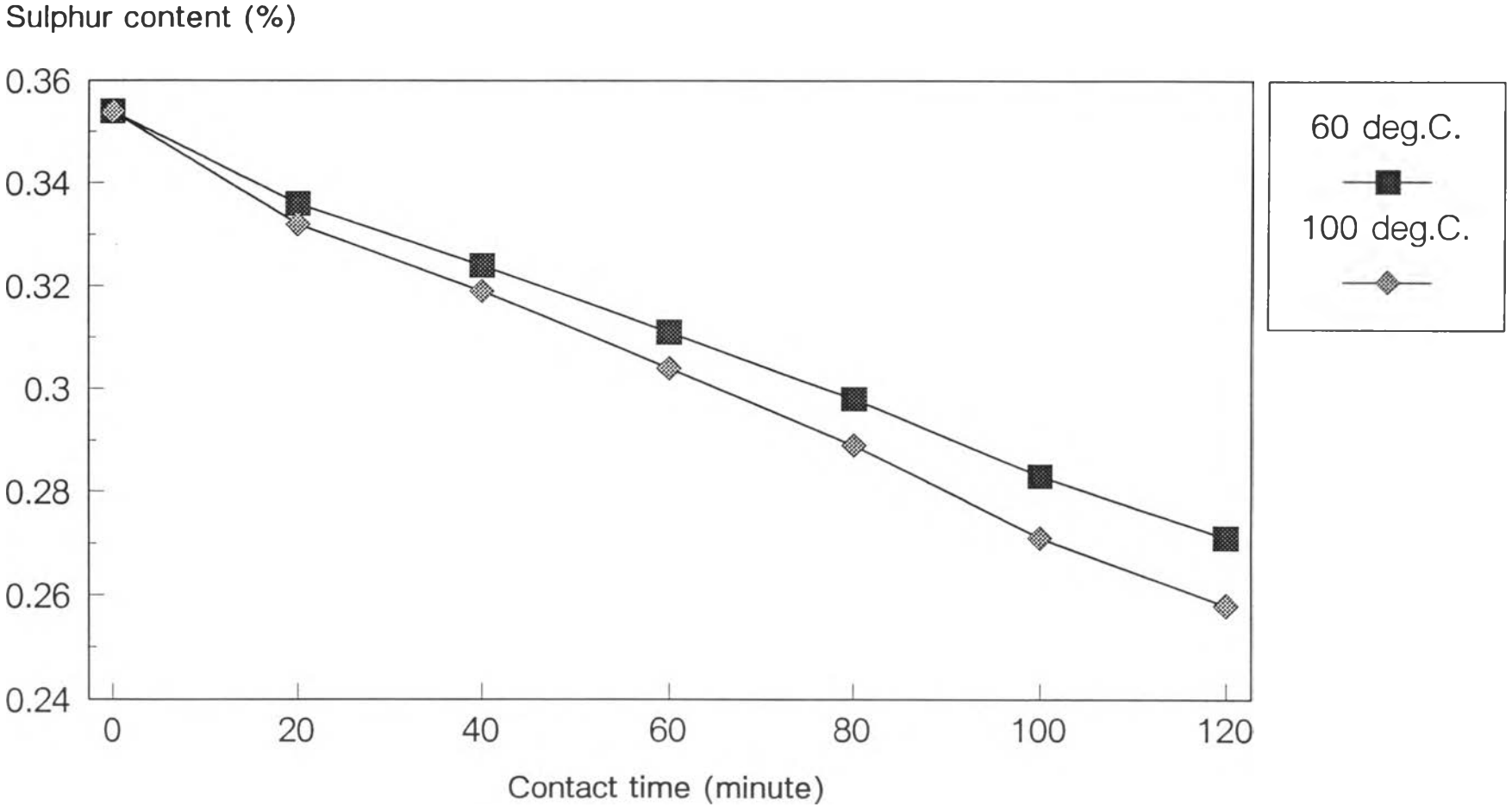


Fig. 5.18 Viscosity and Viscosity index of 600 SN after percolation process at various contact and different temperature , 60 C. and 100 C. .

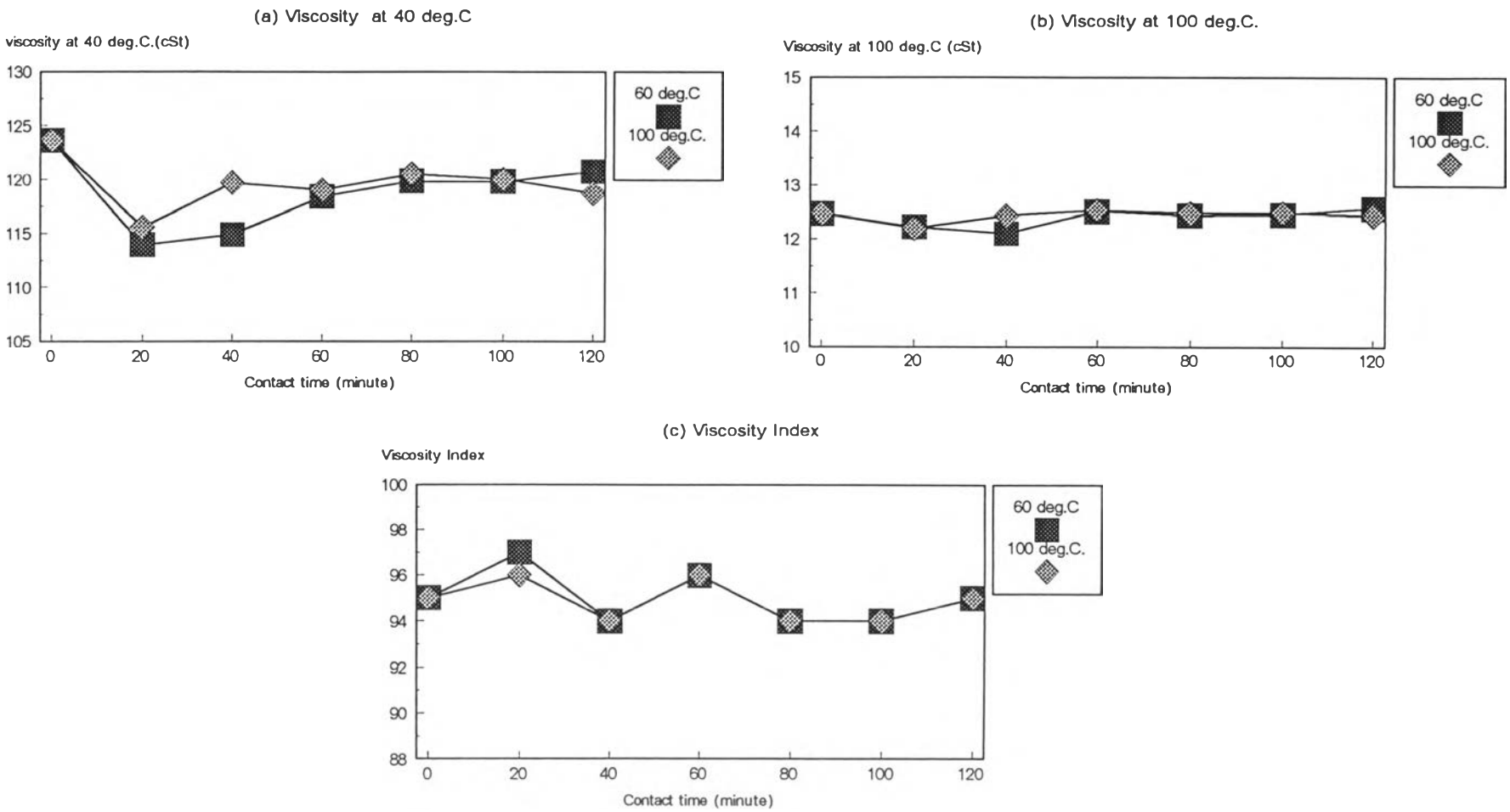


Fig. 5.19 Compositions of 600 SN after percolation process at various contact and different temperature , 60 C. and 100 C. .

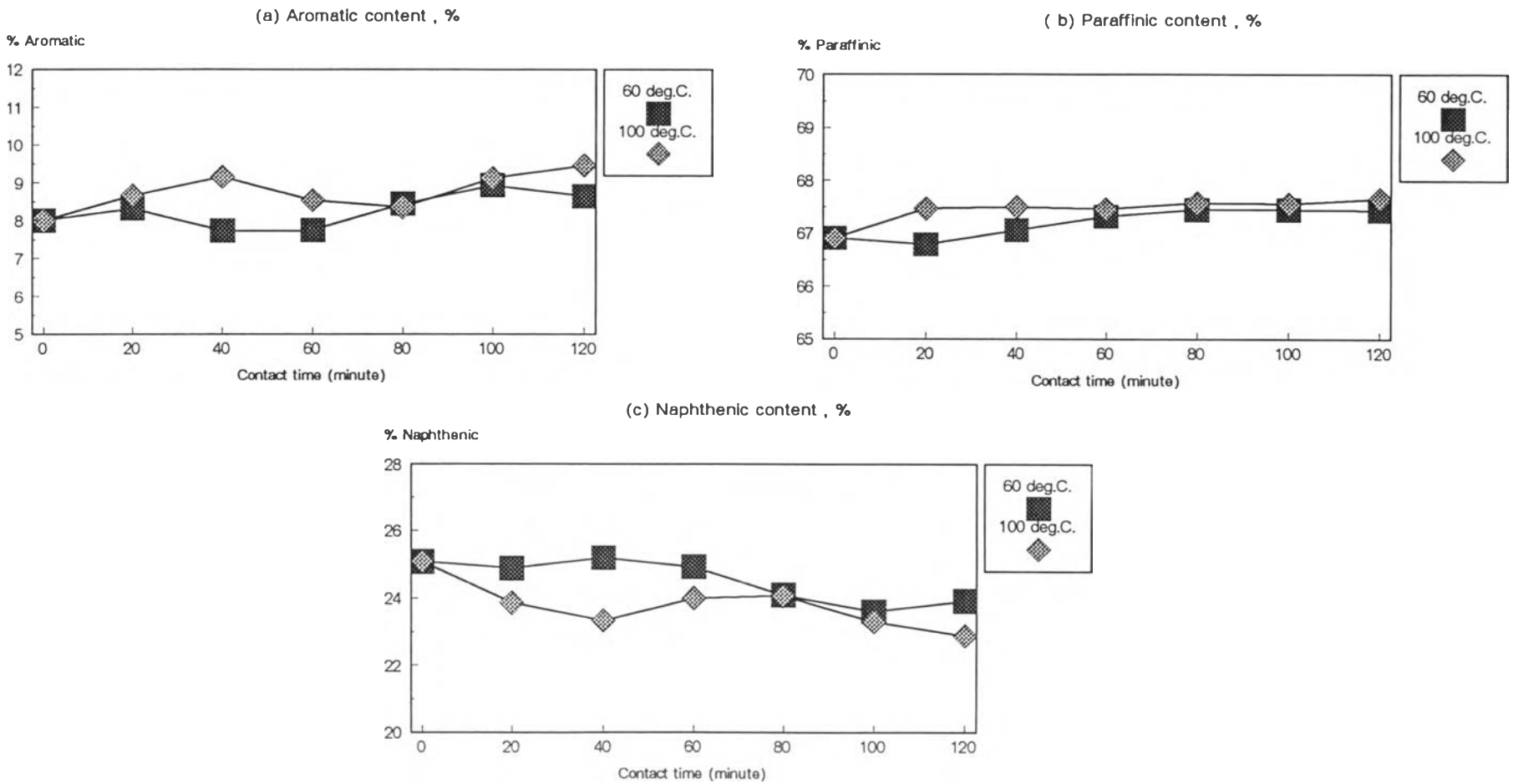


Fig. 5.20 Color of 600 SN after percolation process at various contact and different temperature , 60 C. and 100 C. .