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APPENDICES

Appendix A: Correlations for n-alkane properties

Thermophysical Properties

$$T_m[K] = 0.040C_n^3 - 2.2133C_n^2 + 46.197C_n - 45.777$$

for $C_n < C_{16}$ (A.1)

$$T_m[K] = 0.0028C_n^3 - 0.3185C_n^2 + 13.559C_n + 143.15$$

for $C_n \geq C_{16}$ (A.2)

$$T_{tr}[K] = -0.0038C_n^3 - 0.1159C_n^2 + 13.386C_n + 108.79$$

for $C_n < C_{16}$ (A.3)

$$T_{tr}[K] = 0.0038C_n^3 - 0.4126C_n^2 + 16.741C_n + 99.885$$

for $C_n \geq C_{16}$ (A.4)

$$\Delta h_{sblm} = h_{vap} + h_m + h_{tr} \quad \text{(A.5)}$$

$$\Delta h_m[kJ/mol] = -0.0009C_n^3 - 0.0011C_n^2 + 3.6119C_n - 16.282$$

for $C_n < C_{19}$ (A.6)

$$\Delta h_m[kJ/mol] = 0.0036C_n^3 - 0.2376C_n^2 + 7.400C_n - 34.814$$

for $C_n \geq C_{19}$ (A.7)

$$\Delta h_{tr}[kJ/mol] = 0.0009C_n^3 + 0.0011C_n^2 + 0.1668C_n + 3.693$$

for $C_n < C_{19}$ (A.8)

$$\Delta h_{tr}[kJ/mol] = -0.0032C_n^3 + 0.2353C_n^2 - 3.912C_n + 25.261$$

for $C_n \geq C_{19}$ (A.9)

Molar volume of component i

Molar volume of n-alkane can be calculated using Group Contribution Method given by Elbro *et al.* (1991).

$$V = \sum n_i \Delta v_i \quad \text{(A.10)}$$

Δv_i is given by the following simple polynomial function:

$$v_i = A_i + B_i T + C_i T^2 \quad \text{(A.11)}$$

Table A-1 Group contributions for saturated molar volume

group	group volume temperature constant		
	A, cm^3/mol	10^3B, cm^3/mol	10^5C, cm^3/mol
CH_3	18.960	45.58	0
CH_2	12.520	12.94	0

Van der Waals volume of normal alkane is given by Bondi (1968)

$$V_w = 10.23 \cdot n \tag{A.12}$$

where n is number of methylene group in the chain of n-alkane

Volume (r) and Surface Area (q) parameter of UNIQUAC equation

Table A-2 Group values for the estimation of the n-alkane structural parameters

group	r_i	q_i
CH_3	0.9011	0.848
CH_2	0.6744	0.540

Appendix B: Carbon Number Distribution of gel deposits collected from cold finger experiments on Model Oil No.1 and Model Oil No. 2

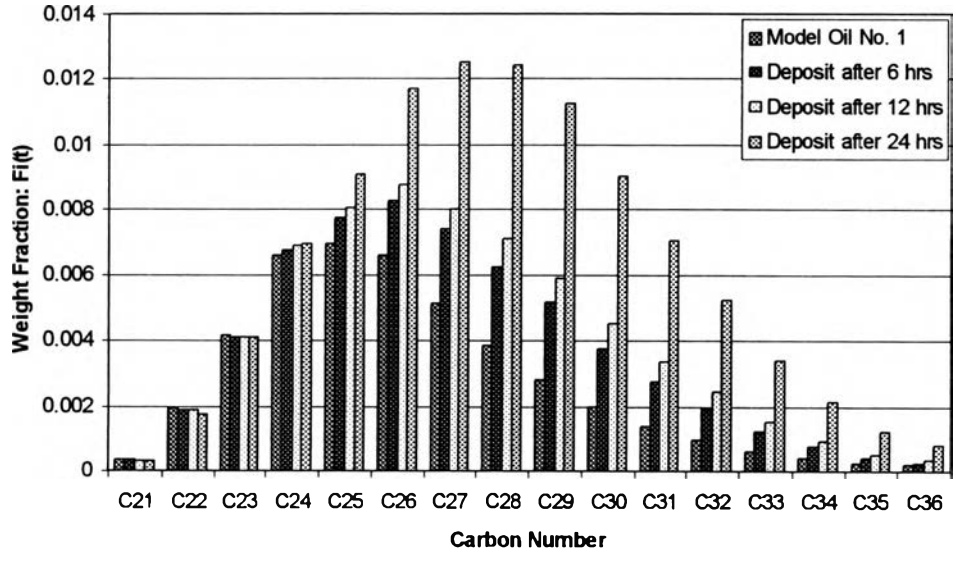

Figure B-1 Carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 1 at various deposition times (temperature of cold finger = 10°C)

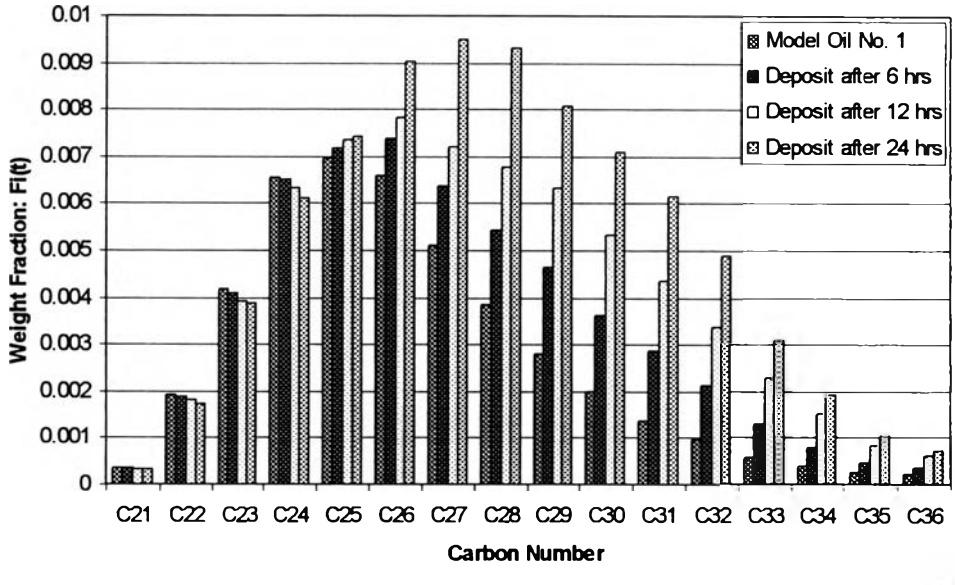

Figure B-2 Carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 1 at various deposition times (temperature of cold finger = 15°C)

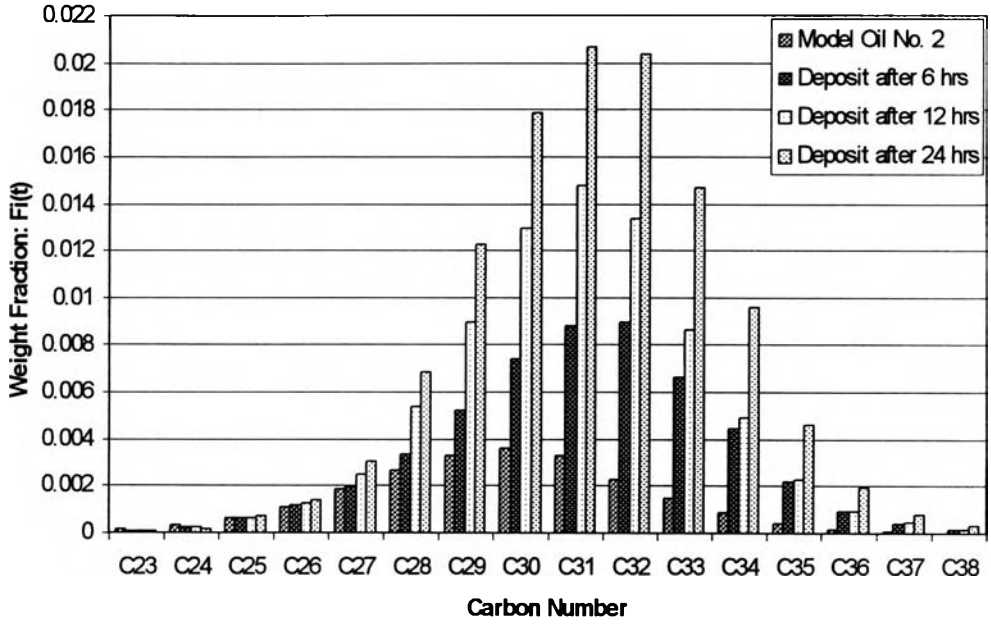

Figure B-3 Carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 2 at various deposition times (temperature of cold finger = 5°C)

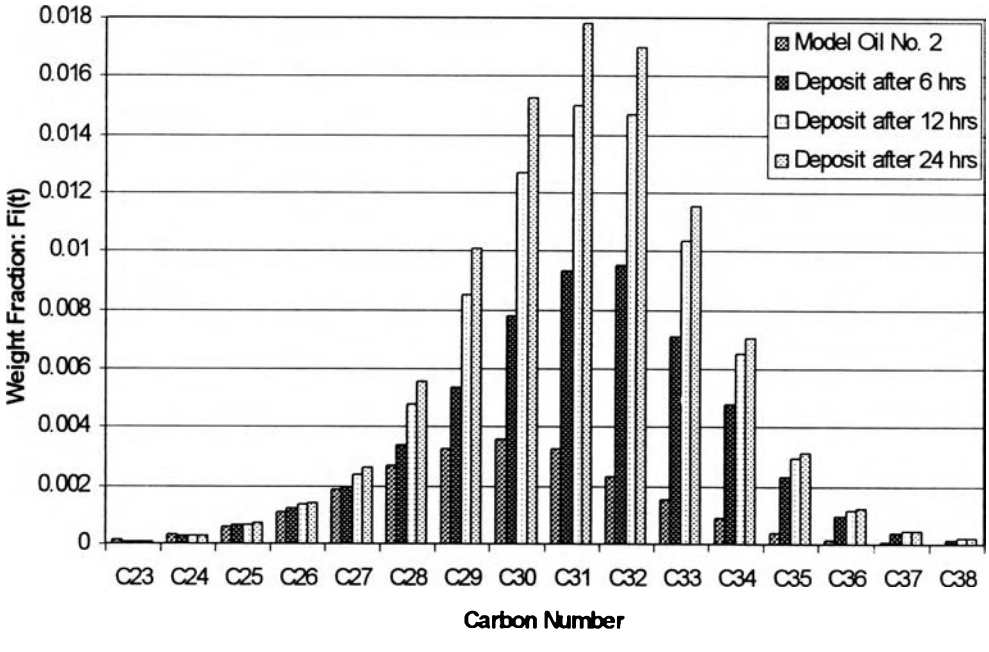

Figure B-4 Carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 2 at various deposition times (temperature of cold finger = 10°C)

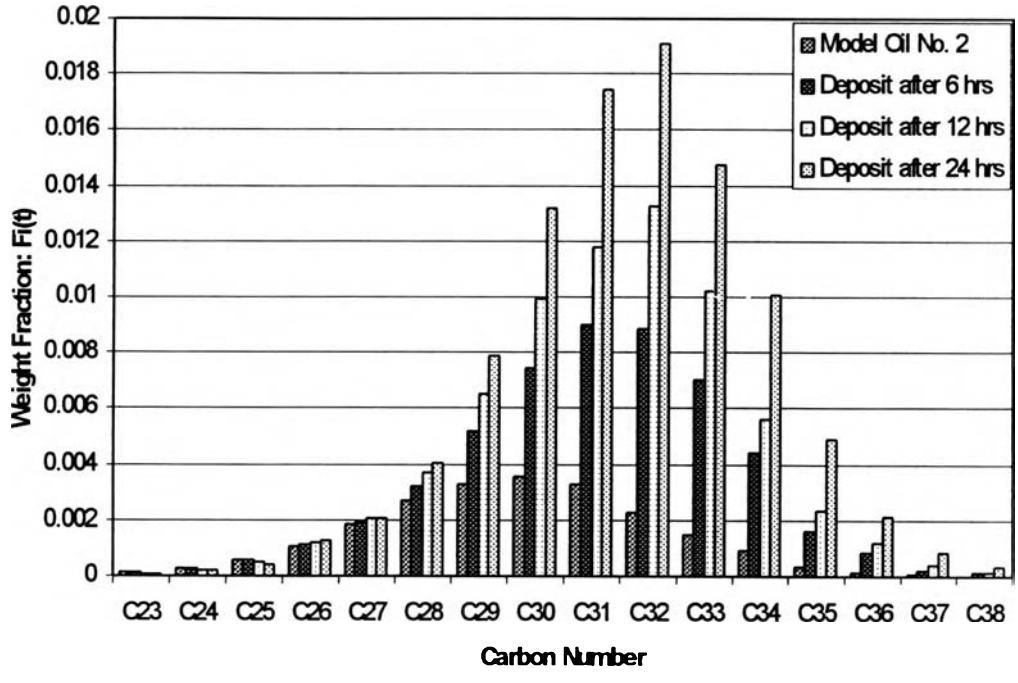

Figure B-5 Carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 2 at various deposition times (temperature of cold finger = 15°C)

Appendix C: Change in Carbon Number Distribution of gel deposits collected from cold finger experiments on Model Oil No.1 and Model Oil No. 2

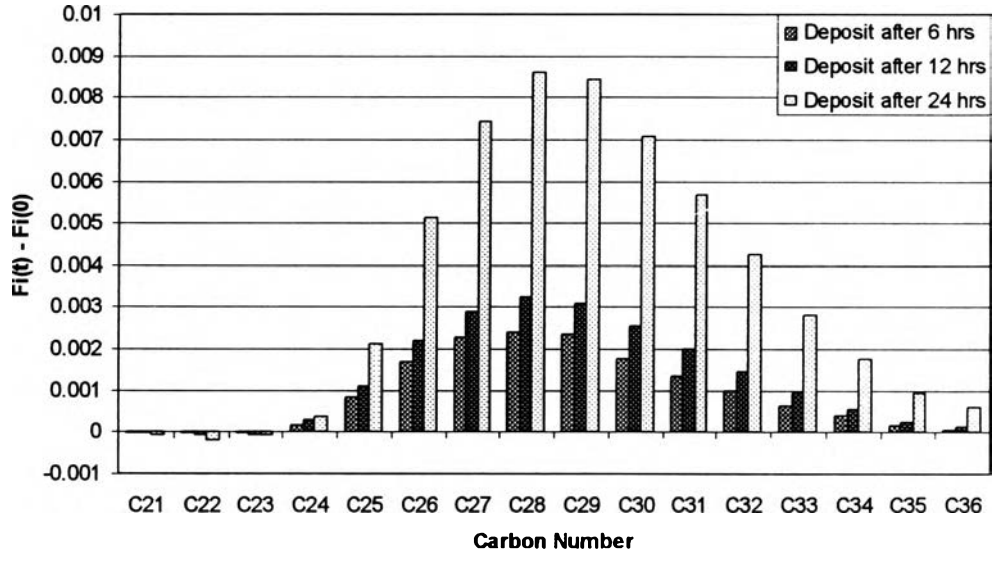

Figure C-1 Changes in carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 1 at various deposition times (temperature of cold finger = 10°C)

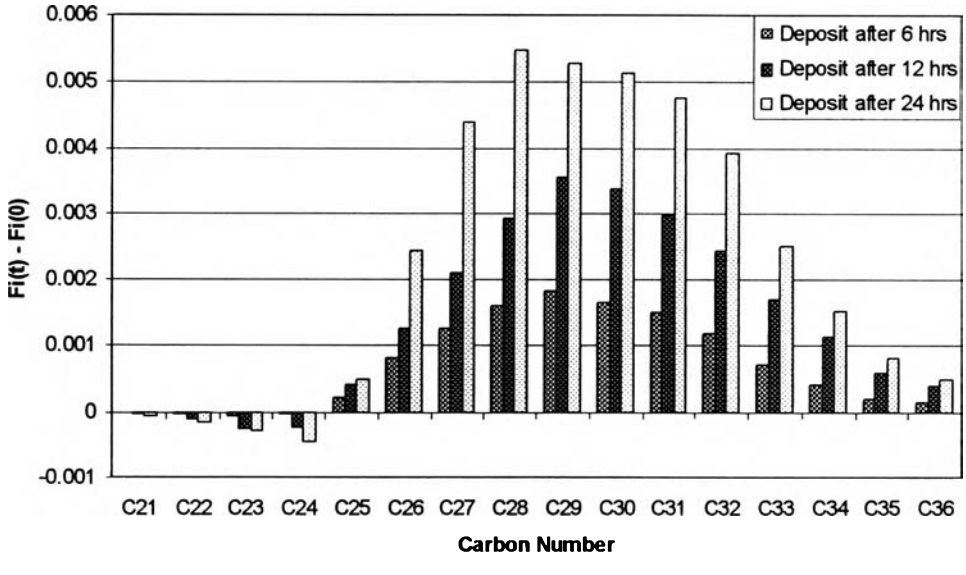

Figure C-2 Changes in carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 1 at various deposition times (temperature of cold finger = 15°C)

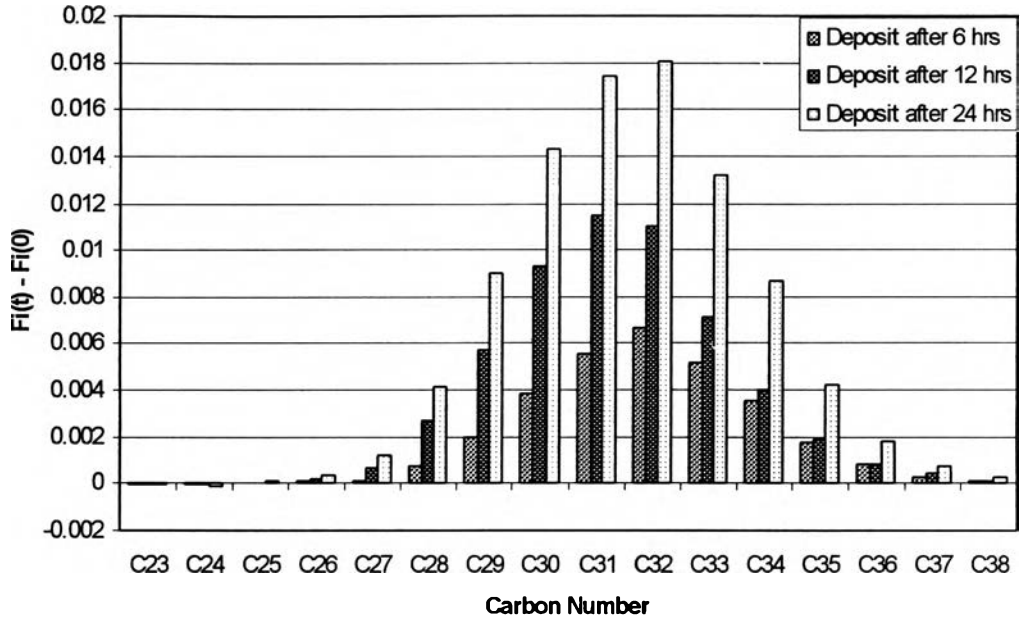

Figure C-3 Changes in carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 2 at various deposition times (temperature of cold finger = 5°C)

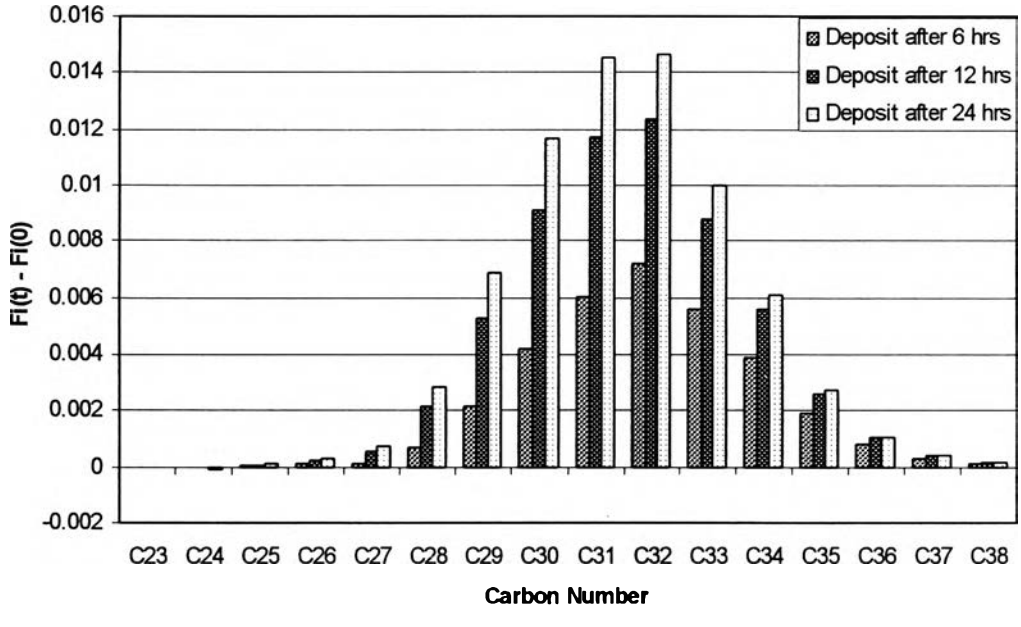

Figure C-4 Changes in carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 2 at various deposition times (temperature of cold finger = 10°C)

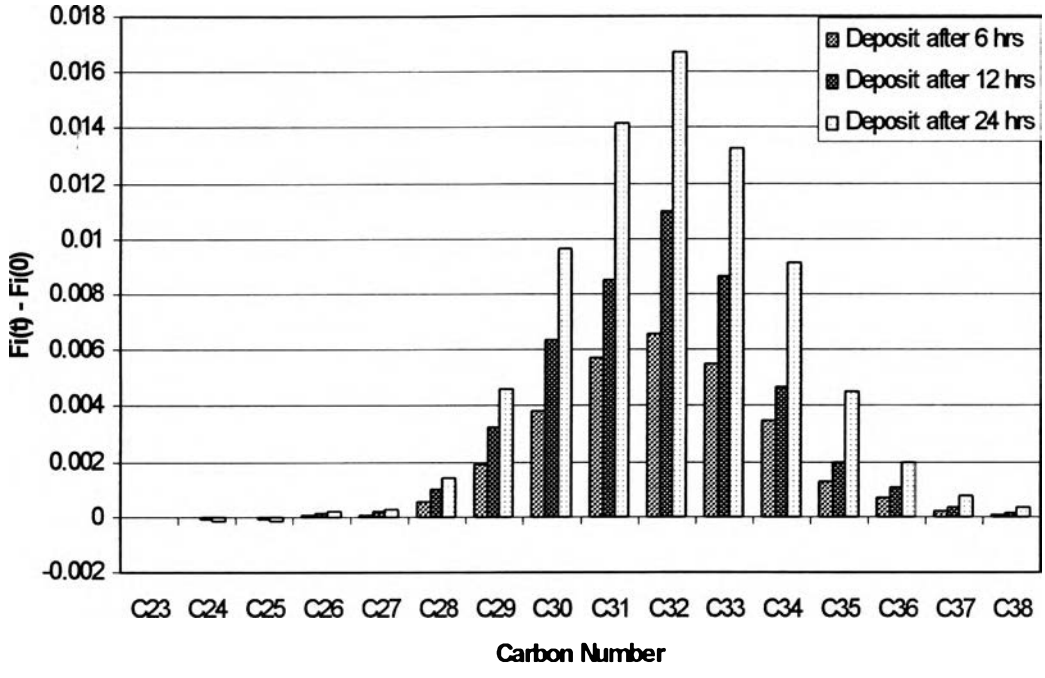

Figure C-5 Changes in carbon number distribution of gel deposits collected from cold finger experiments on Model Oil No. 2 at various deposition times (temperature of cold finger = 15°C)

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