

Table S1. List of the species sampled in this study, together with their collection sites. Samples were collected in summer 2017 and 2018.

	collection site	collection date
<i>Formica polyctena</i> *	Mainz, Ober-Olmer Wald	August 2018
<i>Formica rufibarbis</i> *	Mainz, meadow near Drais	August 2018
<i>Lasius brunneus</i>	Mainz, Neustadt	September 2018
<i>Lasius fuliginosus</i> *	Mainz, Ober-Olmer Wald	August 2018
<i>Lasius neglectus</i> *	Jena, Botanical garden	September 2018
<i>Lasius niger</i> *	Mainz, meadow near Drais	August 2018
<i>Lasius platyborax</i> *	Mainz, Ober-Olmer Wald	August 2018
<i>Myrmica rubra</i> *	Mainz, Ober-Olmer Wald	August 2018
<i>Myrmica ruginodis</i> *	Darmstadt, forest	August 2017
<i>Myrmica sabuleti</i>	Bayreuth, Botanical garden	August 2017
<i>Myrmica salina</i>	Bayreuth, Botanical garden	August 2017

Table S2. Heat converted for melting between -75 °C and +60 °C extracted from DSC curves (second heating cycle). Values were determined via integration of the baseline corrected signals in 15 °C intervals and summed up to give the total melting heat. Relative values refer to the total heat set as 100%. Areas being slightly above baseline due to the baseline correction are marked in italics and were set to 0 (actual values are given in brackets) because they were considered negligible.

		-75 to -60 °C	-60 to -45 °C	-45 to -30 °C	-30 to -15 °C	-15 to 0 °C	0 to 15 °C
<i>Formica polyctena</i>	heat / mJ	0.36312	1.86245	6.91989	16.61972	34.21124	24.98026
	% of total heat	0.3	1.3	4.8	11.5	23.8	17.3
<i>Formica rufibarbis</i>	heat / mJ	0.86869	2.87114	1.23311	13.83449	78.70639	24.87660
	% of total heat	0.6	2.1	0.9	10.1	57.4	18.1
<i>Lasius fuliginosus</i>	heat / mJ	0.78359	4.89824	10.31143	31.93359	19.41610	11.39091
	% of total heat	1.0	6.0	12.5	38.8	23.6	13.9
<i>Lasius neglectus</i>	heat / mJ	<i>0.0</i> (0.03494)	<i>0.0</i> (0.02409)	0.46511	5.13222	5.39218	2.49449
	% of total heat	0.0	0.0	3.3	36.2	38.0	17.6
<i>Lasius niger</i>	heat / mJ	<i>0.0</i> (0.09742)	0.30877	2.71317	6.87460	19.20335	11.97190
	% of total heat	0.0	0.5	4.1	10.5	29.3	18.3
<i>Lasius platythorax</i>	heat / mJ	<i>0.0</i> (0.00946)	<i>0.0</i> (0.02426)	0.38077	2.62343	4.44898	2.31883
	% of total heat	0.0	0.0	3.7	25.6	43.4	22.6
<i>Myrmica ruginodis</i>	heat / mJ	<i>0.0</i> (0.33855)	1.23845	6.12977	12.80844	19.68661	20.91367
	% of total heat	0.0	1.8	8.8	18.5	28.4	30.2
<i>Myrmica rubra</i>	heat / mJ	0.01116	0.03101	0.51440	0.91569	3.47433	1.15866
	% of total heat	0.2	0.4	7.0	12.4	47.2	15.8

		15 to 30 °C	30 to 45 °C	45 to 60 °C	total
<i>Formica polycтена</i>	heat / mJ	17.50006	40.74417	0.83581	144.03672
	% of total heat	12.1	28.3	0.6	100
<i>Formica rufibarbis</i>	heat / mJ	10.08670	3.55870	1.03363	137.06945
	% of total heat	7.4	2.6	0.8	100
<i>Lasius fuliginosus</i>	heat / mJ	3.45768	0.0 (0.75923)	0.0 (0.49584)	82.19154
	% of total heat	4.2	0.0	0.0	100
<i>Lasius neglectus</i>	heat / mJ	0.65904	0.0 (0.04404)	0.03849	14.18153
	% of total heat	4.6	0.0	0.3	100
<i>Lasius niger</i>	heat / mJ	12.08685	12.30039	0.0 (0.79214)	65.45903
	% of total heat	18.5	18.8	0.0	100
<i>Lasius platythorax</i>	heat / mJ	0.48422	0.00116	0.0 (0.00746)	10.25739
	% of total heat	4.7	0.0	0.0	100
<i>Myrmica ruginodis</i>	heat / mJ	6.33235	2.18467	0.0 (0.27681)	69.29396
	% of total heat	9.1	3.2	0.0	100
<i>Myrmica rubra</i>	heat / mJ	1.25315	0.0 (0.11711)	0.0 (0.02301)	7.35840
	% of total heat	17.0	0.0	0.0	100

Table S3. Model results of the impact of chemical composition on viscosity. We separately ran linear models for each measurement temperature of viscosity. The independent factors were the first two principal components (with interaction allowed) and the average chain length of the CHC profile. All factors had $df=1$.

T=20°C	F	p
PC1	1.5	0.25
PC2	0.32	0.58
PC1:PC2	0.85	0.38
chain length	0.16	0.7
T=25°C		
PC1	6.24	0.024*
PC2	0.06	0.81
PC1:PC2	4.23	0.056
chain length	1.84	0.19
T=28°C		
PC1	3.24	0.092
PC2	0.01	0.91
PC1:PC2	1.87	0.19
chain length	0.46	0.51

Table S4. Literature data of viscosities of the other liquids shown in Fig. 4.

	viscosity (Pa.s)	measurement temperature	source
hexane	0.0003	25°C	https://wiki.anton-paar.com ; accessed on 11-7-2019
water	0.001	21.1°C	http://www.vp-scientific.com/Viscosity_Tables.htm ; accessed 11-7-2019
milk	0.003	21.1°C	http://www.vp-scientific.com/Viscosity_Tables.htm ; accessed 11-7-2019
olive oil	0.0562	26°C	Diamante & Lan 2014
motor oil SAE10	0.11 (0.085-0.14)	21.1°C	http://www.vp-scientific.com/Viscosity_Tables.htm ; accessed 11-7-2019
motor oil SAE40	0.775 (0.65-0.9)	21.1°C	http://www.vp-scientific.com/Viscosity_Tables.htm ; accessed 11-7-2019
honey	8156	24°C	https://wiki.anton-paar.com ; accessed on 11-7-2019

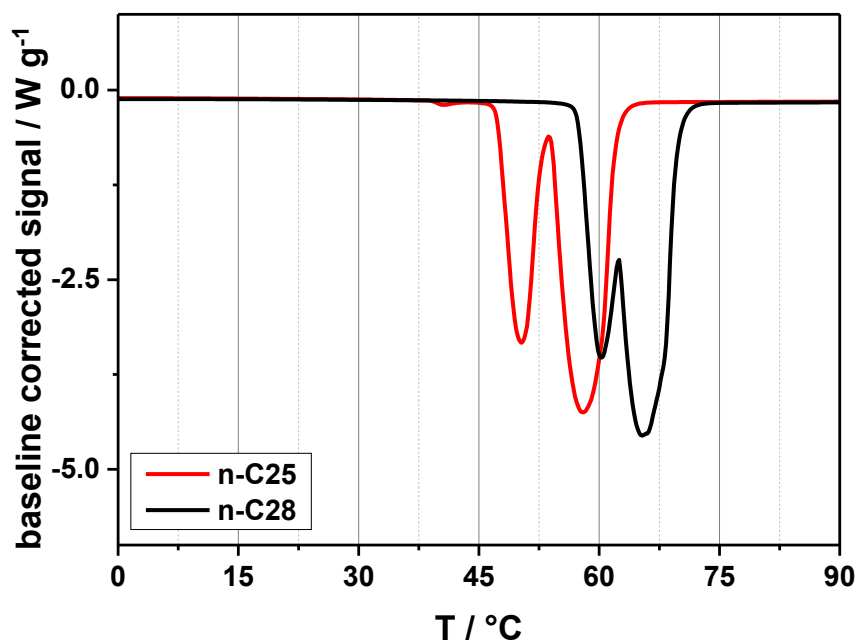
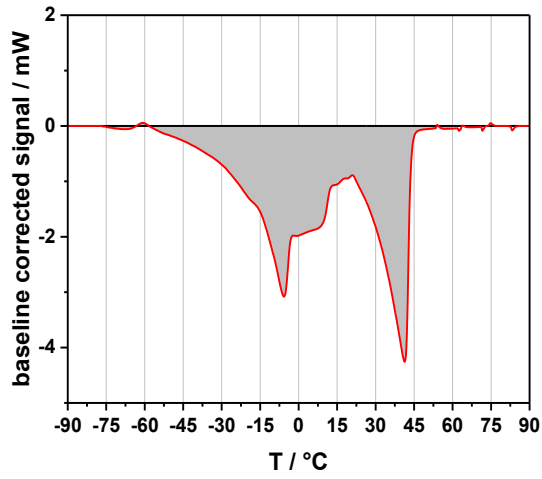
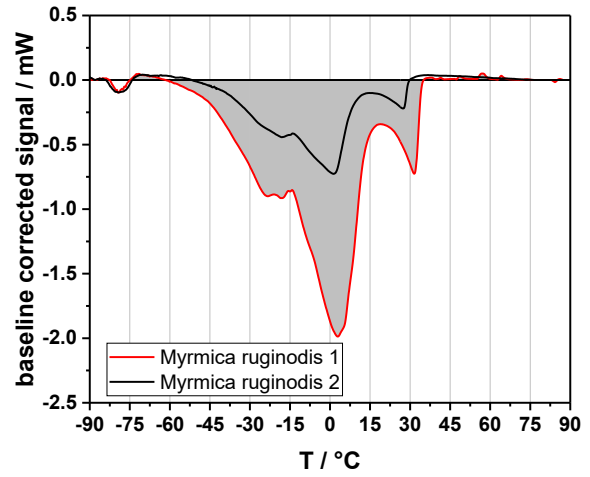


Fig. S1 DSC melting curves of reference *n*-alkanes (*n*-C25 and *n*-C28). All curves display the second heating cycle (heat rate of 10 K/min), are baseline corrected and normalized to the sample mass. Identified phase transition temperatures are C25: $T_1 = 50.3$ °C, $T_2 = 58.0$ °C; C28: $T_1 = 60.3$ °C, $T_2 = 65.3$ °C. T_1 results from a solid-solid phase transition between two crystal structures while T_2 represents the actual melting point. The obtained data is in good agreement with reported literature values (Srivastava et al., 1993).

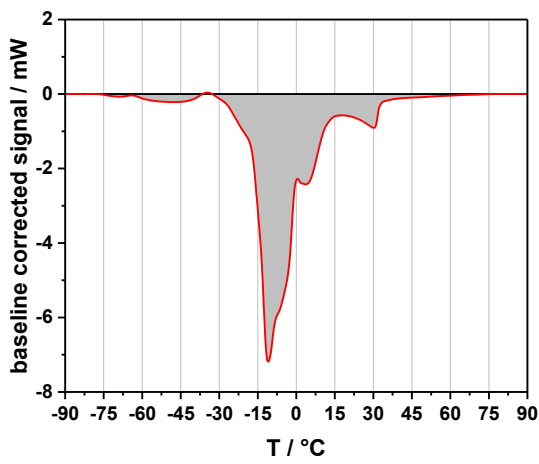
Formica polyctena



Myrmica ruginodis



Formica rufibarbis



Myrmica rubra

