ID N° 22498 - Contact Angle Measurement - M4^{s+}

Executed on Mai 22, 2023, by Augsburg-Lab

Cu-Stab

*Screening-Sequenz. Start /Ende mit statischer Messung *** 20:11:48 #Charaterisierung Sequenz A.*
Probekörper: Blank pollierter Kupferzylinder Ø7.971mm.

- **Kupfer / Isooktan 99.5+%** : (20,0°C, 9,9', 20mm, 0,0511mm/s - static; *Θ-superwetting*)

$\Theta_{C,S}$ = 0$_{\pm 0°}$ CAH 0°, **$^{a}\bar{E}_S$ = 19,733$_{\pm 0,071}$ mN/m** $^{a}H_S$ 0,043mN/m, **$\bar{B}_{\%,S}$= 105,2%**

Report

2. ===== Collection of Measurements in this Series Kupfer/Isooktan 99.5+% ======

Tabelle 1.2: Conditions and Results

N°	IDN° ...erData39	ϑ [°C]	Δτ [min]	$\bar{v}_z$ [mm/s]	$\bar{C}a$ [1]	$t_{eq.}$ [s]	Θ_M [°]	CAH [°]	^{a}H [mN/m]	$^{a}\bar{E}$ [mN/m]	±σ [mN/m]	$\bar{S}$ [mJ/m²]	$\bar{B}_{\%,Isookta...}$ [%]
1.	**22498$_0$**	**20,01**	****0****	**»0,0456«**	**-**	***3,08***	***<0>***	***<0>***	**0,043**	**19,733**	**±0,071**	**0,983**	**105,2%**
2.	22499$_1$	20,008	+23,6	10,0	2,65E-4	*5,5*	*<90>*	*<-180>*	80,56	20,3	±1,3	1,55	108,2%
3.	22500$_2$	20,01	+24,6	5,00	1,32E-4	*5,3*	*<45>*	*<-89>*	40,59	20,75	±0,66	2,00	110,6%
4.	22501$_3$	20,021	+25,6	2,50	6,61E-5	*5,3*	*<53>*	*<-110>*	52,05	20,77	±0,33	2,02	110,7%
5.	22502$_4$	20,022	+26,7	1,25	3,31E-5	*5,3*	*<33>*	*<-66>*	26,48	20,88	±0,18	2,13	111,4%
6.	22503$_5$	20,022	+28,1	0,625	1,65E-5	*5,3*	*<20>*	*<-41>*	13,09	20,79	±0,16	2,04	110,9%
7.	22504$_6$	20,006	+30,3	0,31	8,27E-6	*6,1*	*<0>*	*<0>*	6,836	23,996	±0,077	5,25	128,0%
8.	22505$_7$	20,01	+64,7	0,156	4,13E-6	*0,7*	*<0>*	*<0>*	3,474	23,49	±0,12	4,74	125,3%
9.	22506$_8$	20,009	+70,4	<0,957>	2,53E-5	*5,0*	*<22>*	*<-45>*	21,55	24,09	±0,20	5,34	128,5%
10.	22507$_9$	20,012	+72,1	<0,710>	1,87E-5	*5,3*	*<22>*	*<-45>*	21,59	24,12	±0,19	5,37	128,6%
11.	22508$_{10}$	20,011	+73,9	<0,318>	8,43E-6	*6,6*	*<12>*	*<-25>*	13,533	23,80	±0,18	5,05	127,0%
12.	22509$_{11}$	20,008	+76,9	<0,357>*	9,42E-6	*5,6*	*<0,05>*	*<-0,1>*	9,721	24,89	±0,13	6,14	132,7%
13.	22510$_{12}$	20,003	+80,0	<0,422>*	1,11E-5	*5,7*	*<9>*	*<-18>*	13,22	24,33	±0,25	5,58	129,8%
14.	22511$_{13}$	20,006	+82,6	<0,392>*	1,04E-5	*6,4*	*<12>*	*<-24>*	14,097	24,06	±0,11	5,31	128,3%
15.	22512$_{14}$	20,006	+85,3	<1,69>*	4,46E-5	*5,7*	*<52>*	*<-100>*	56,7	24,248	±0,060	5,50	129,3%
16.	22513$_{15}$	20,006	+86,5	<1,93>*	5,10E-5	*5,5*	*<51>*	*<-100>*	56,95	24,52	±0,31	5,77	130,7%
17.	22514$_{16}$	20,007	+87,8	<2,55>*	6,74E-5	*5,2*	*<51>*	*<-100>*	56,00	23,87	±0,19	5,12	127,3%
18.	22515$_{17}$	20,01	+88,9	<4,43>*	1,17E-4	*5,1*	*<52>*	*<-100>*	60,6	25,69	±0,20	6,94	137,0%
19.	22516$_{18}$	20,01	+89,9	<6,70>	1,77E-4	*5,1*	*<90>*	*<-180>*	98,7	22,5	±3,3	3,75	119,7%
20.	22517$_{19}$	20,01	+90,8	»0,0450«	-	*3,15*	*<0>*	*<0>*	0,345	23,958	±0,068	5,21	127,8%
21.	22518$_{20}$	20,01	+109	»0,0448«	-	*3,13*	*<0>*	*<0>*	0,101	23,646	±0,083	4,90	126,1%

*This table provides an overview of the measurements in this series. Each seperate M4 measurement is referenced by IDN°. The highlighted row indicates the data set of the measurement documented below. The column labeled **ϑ** shows the measurement temperature, **Δτ** the time interval to previous/following measurements, $\bar{v}_z$ the movement speed - where additional symbols clarify: »**n**« indicates static measurements, **<n>** represents distance-accelerated movement of the triple line, '*' stands for continous acceleration and a number without any symbol indicates a constant movement speed, **$\bar{C}a$** is the capillary number, **$t_{eq.}$** is the equilibration time before turnaround - but for static measurements the number denotes the average equilibration time as a levelling time between the measurement points, **Θ_M** is the mean of the advancing and receding contact angle ('**<n>**' signs "errors"), contact angle hysteresis is given in degrees (**CAH**) and in energy units (^{a}H), $^{a}\bar{E}$ is the mean adhesion energy, and **±σ** is the corresponding standard deviation, $\bar{S}$ is the mean of the spreading parameter, and $\bar{B}_{\%,Isookta...}$ indicates the relative wettability ($B_{\%,lq/sl/md...}$= 100%·$^{a}E/\gamma$).*

Tabelle 2.2: Summary of sample weights in the individual measurements (initial weight W_0 = 24,6678 g)

N°	W_A [g]	ΔW_{A-0} [mg]	W_E [g]	ΔW_{E-0} [mg]	V_{E-0} [µL]	ΔV_{E-A} [µL]
1.	**24,6678**	**0,0**	**24,6763**	**8,5**	**12,3**	**12**
2.	24,6764	8,6	24,6802	12,4	17,9	5,6
3.	24,6800	12,2	24,6775	9,7	14,0	-3,9
4.	24,6773	9,5	24,6758	8,0	11,6	-2,5
5.	24,6755	7,7	24,6746	6,8	9,8	-1,7
6.	24,6745	6,7	24,6738	6,0	8,7	-1,2
7.	24,6738	6,0	24,6736	5,8	8,4	-0,29
8.	24,6736	5,8	24,6733	5,5	7,9	-0,43
9.	24,6734	5,6	24,6746	6,8	9,8	1,9
10.	24,6745	6,7	24,6741	6,3	9,1	-0,72
11.	24,6740	6,2	24,6735	5,7	8,2	-0,87
12.	24,6734	5,6	24,6733	5,5	7,9	-0,29
13.	24,6733	5,5	24,6742	6,4	9,2	1,3
14.	24,6742	6,4	24,6742	6,4	9,2	~0
15.	24,6741	6,3	24,6764	8,6	12,4	3,2
16.	24,6763	8,5	24,6767	8,9	12,9	0,43
17.	24,6766	8,8	24,6775	9,7	14,0	1,2
18.	24,6773	9,5	24,6796	11,8	17,1	3,0
19.	24,6794	11,6	24,6779	10,1	14,6	-2,5
20.	24,6778	10,0	24,6763	8,5	12,3	-2,3
21.	24,6764	8,6	24,6731	5,3	7,7	-4,6

*Symbols: **W_A**: Total weight before each measurement, **ΔW_{0-A}**: Change in weight from the initial weight W_0 at the start of the series, **W_E**: Total weight after the measurement (possibly including the weight of any adherent fluid), **ΔW_{E-0}**: Change in weight from the initial weight W_0 at the start of the series, **V_{E-0}**: Weight change interpreted as fluid volume, **ΔV_{E-A}**: Fluid volume change calculated as the difference between W_E and W_A. (Automated weighings without contact to the surface of the fluid).*

3. ===== Measurement IDN°22498: *Static* Contact Angle ======

Kupfer, cylindric Ø7,971mm

20mm Kupfer\Isooktan 99.5+%, γ =18,75mN/m ϑ=20,0°C

Contact Angle, CA Θ_C	**<0 ±0°>**	- superwetting -	
Contact Angle Hysteresis, CAH_s	<0°>		
	Advancing $\Theta_{A,s}$	**Receding $\Theta_{R,s}$**	Transition - mm
Contact Angles, Θ_s	**0°**	**0°**	$0°_{adv.} \Rightarrow 0°_{rec.}$
Rated measurements n mm-range	100 0,200 - 20,001mm	113 20,001 - 0,000mm	2 20,001 - 19,951mm
avg. Triple line speed $\bar{v}_z$ [mm/s]	*0,0511* ±0,0218	*-0,0400* ±1,47	
avg. Step distance $\bar{\Delta}h_0$ [mm]	0,200 ±9,95E-05	-0,178 ±0,0536	
avg. equilibration Time $\bar{t}_{eq.}$ [s]	**3,07 ±0,236**	**3,08 ±0,314**	

Static Contact Angle Measurement: For superwetting - consider adhesion parameters for analysis. The avg. equilibration Time $t_{eq.}$ is the mean of the time between positioning and aquiring the wetting force. The criterion of force equilibrium is defined in the utilized IMPro.

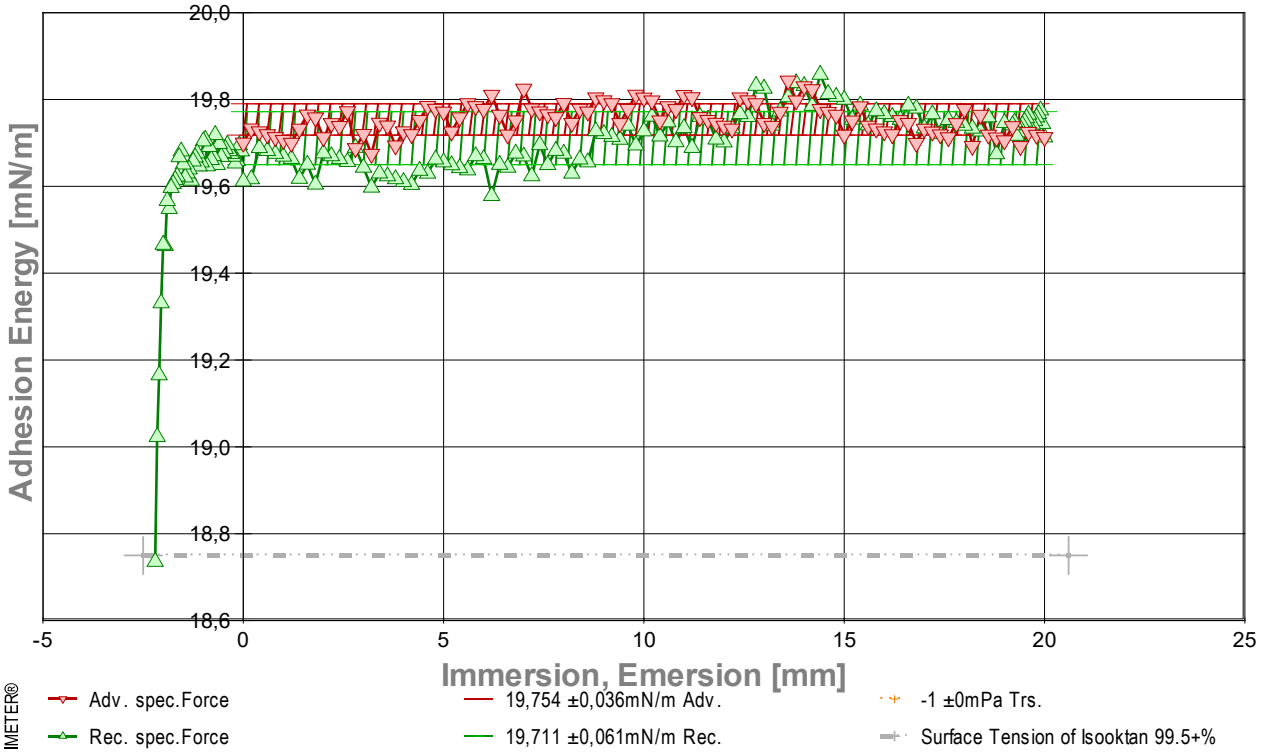
Adhesion Force of the equilibrated Triple Line

Energy of Adhesion, $^a\bar{E}_S=(^aE_A+^aE_R)/2$	**19,733 ±0,071 mN/m**
Hysteresis, $^aH_s = {}^aE_A - {}^aE_R$	0,043 mN/m
Parameter of spreading, $\bar{S}_s = {}^a\bar{E} - \gamma$	0,983 mJ/m²
relative wettability, $\bar{B}_{\%,s}=100\cdot{}^a\bar{E}/\gamma$	105,2% with Isooktan 99.5+%

	Advancing $^aE_{A,s}$	**Receding $^aE_{R,s}$**	Transition - mm
Energy of Adhesion, ^aE_s [mN/m]	**19,754**	**19,711**	$19{,}744_{<adv.>} \Rightarrow 19{,}775$ rec.
Standard deviation $^a\sigma$ [mN/m]	±0,036	±0,061	±0
Linear regression, slope [mPa]	*0*	*0*	-1
correlation coefficient r^2	-	-	1,0
Relative wettability, $B_{\%,s}$	105,4%	105,1%	

Data has left the region of measurable Contact Angles. resolving a kind of superwetting: $^aE_{A,R} > \gamma\cdot\cos\Theta$ and wettability B>100%

¬ Diagramm 1.3: 'Triple-line Force²' static forces at the triple line, $\bar{v}_z$=0,046 mm/s



- Das Diagramm zeigt den Verlauf der Adhäsionsenergie ^aE entlang der Probenoberfläche. Den Messwerte werden bei unbewegtem Pegel des Fluids am Probekörper als statische Gleichgewichtszustände bestimmt. Die roten ∇-Markierungen stehen für adv.-Messwerte (Eintauchen; von links nach rechts aufgezeichnet), grüne Δ-Markierungen gehören zu rec.-Werten (Rückzugsbewegung; von rechts nach links laufend). Die Oberflächenspannung von Isooktan 99.5+% ist als grau gestrichelte Horizontale bei 18,75 mN/m eingezeichnet; sie gibt die *maximale Zugfestigkeit* an, die eine flüssige Isooktan 99.5+%-Oberfläche aushalten kann. Doch, die Adhäsionsenergie zwischen Isooktan 99.5+% und Kupfer übersteigt die Oberflächenspannung. Diese *Überbenetzung* (*Superwetting*) ist gekennzeichnet durch die *Kontaktwinkelproblematik*, gemäß tatsächlich *cos(Θ)>1* eintritt. Insofern andere Störeinflüsse (ggf. elektrostatische, rheologische) auszuschließen sind, kommen Grenzschicht- und/oder tribologische Effekte in Frage, die den lokalen Wert der Oberflächenspannung raumgreifend - oder den Wert einer ungeklärten Zusatzkraft an der *Triple Line* - steigern und das Geschehen verändern könnten.

4. ===== Details on the Measurement and Setup ======

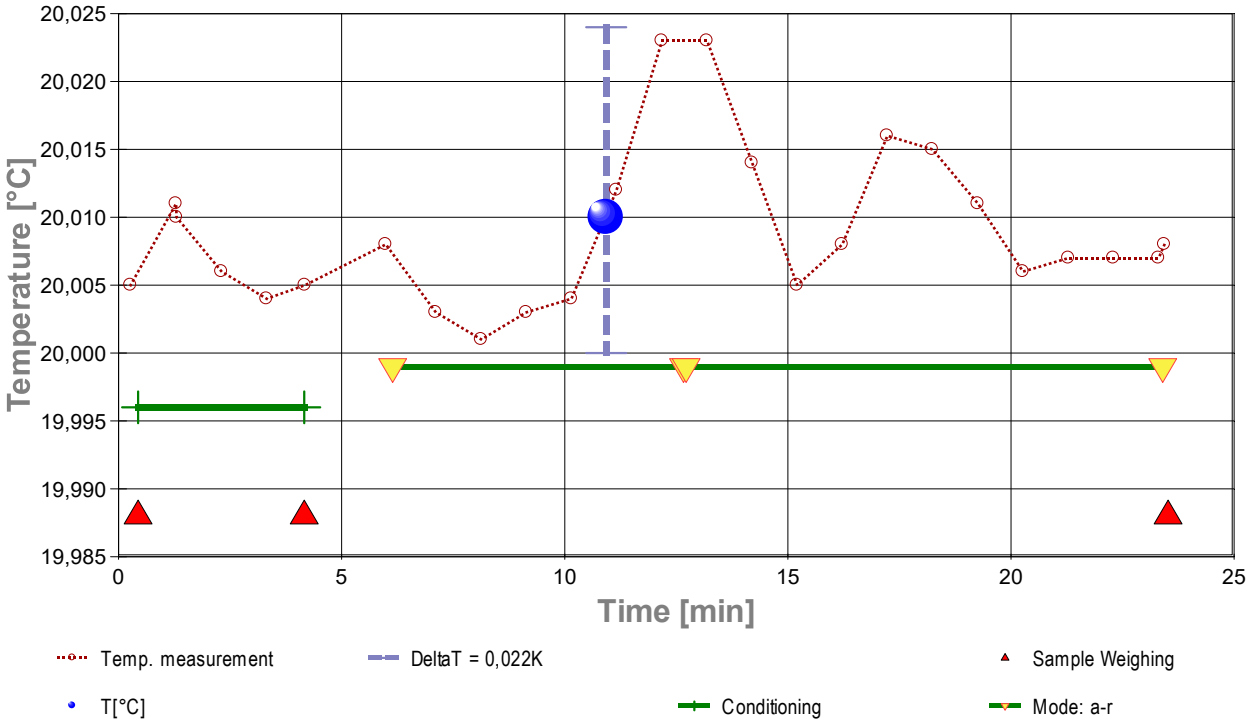
Sample: *'Kupfer'*, **Form:** cylindric, diameter 7,971 mm.
Test Liquid: *'Isooktan 99.5+%'* at 20,01°C: density 0,69190 g/mL, surface tension 18,75 mN/m, viscosity 0,4959 mPa·s; Capillary length 1,66 mm.

Suspension/Fixation: *by operator*.
Vessel: *tempered double wall measuring cell, height 140 mm, inclosing sample and liquid at coherent temperature and atmosphere*; Surface area ∞ by *CLT*. - *The 'CLT' Constant-Level-Technic prevents rising/falling of the Isooktan 99.5+%-level in the vessel (surface 1452mm²) through immersion/emersion of the sample volume in the vessel by appropriate pumping of Isooktan 99.5+%.*

Conditioning: during 3,3 min in the measuring cell above the surface of the liquid.
Sample Weight: at start 24,6678 g, after conditioning 24,6678 g, after the measurement 24,6763 g.
Measurement algorithm: static CA-measurement, acquisition of equilibrated values, stepwise movement. Maximum immersion of

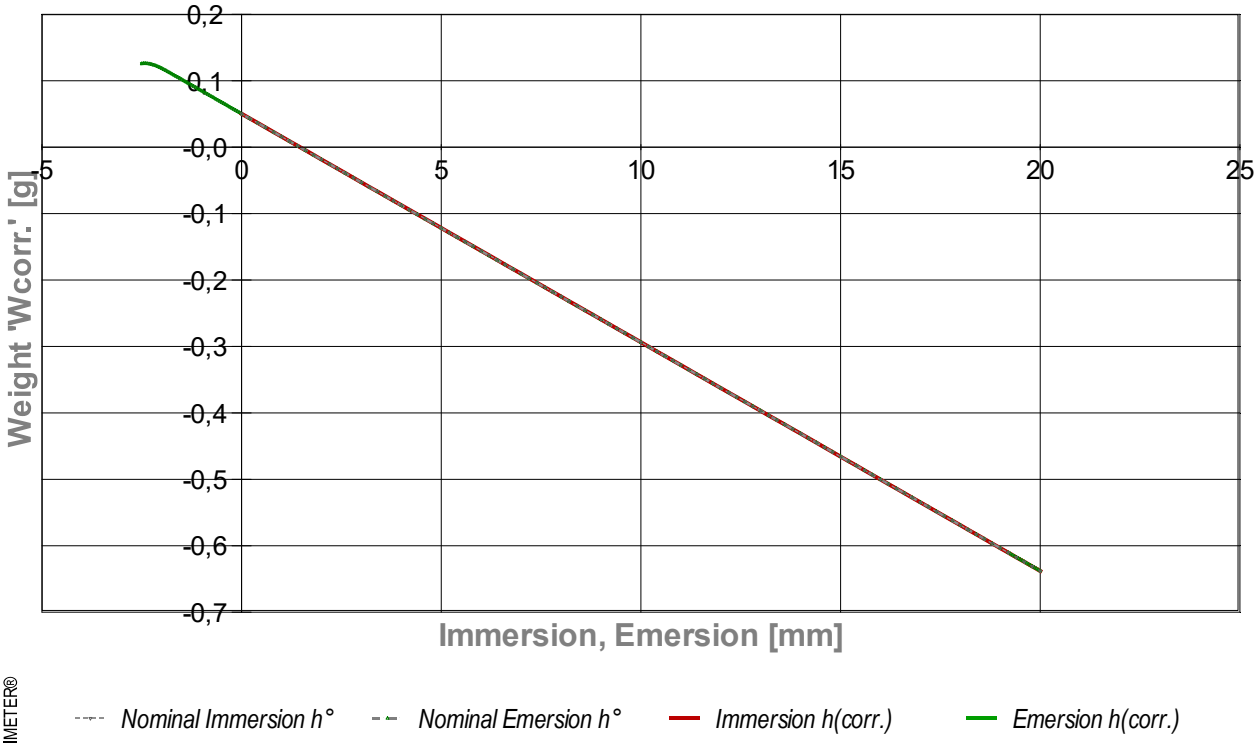
20,001 mm and force equilibration at the inflection point for 3,4 s. Duration for immersion 6,5 min, for emersion 3,4 min.

Time & Temperature: 20 Minuten; Temperaturverlauf blieb im gesamten Zeitraum in etwa isotherm bei 20,01°C. ¬ *Diagramm 2.4: 'Temperature & Events²' -- Survey on Temperature and Time*



- Das Diagramm "Temperature & Events²" dokumentiert neben der Flüssigkeitstemperatur der Messfluids (Isooktan 99.5+%) die zeitliche Abfolge der Verfahrensschritte. Die Temperaturmesswerte sind als kleine Kreise abgebildet; die kugelförmige Marke gibt die der Messung insgesamt zugeordnete Temperatur an (20,01°C). Markierungen auf der horizontalen grünen Linie bilden das Zeitintervall der Konditionierung ab, das auf das Einsetzen der Probe folgt. Weitere gelbe Dreiecke auf der grünen Horizontalen bezeichnen die Schaltung jweiliger Messmodi ('a-r' bedeutet *Advancing*- - und *Receding*-Bewegung). Die roten Dreiecke, unten im Diagramm, markieren die Zeitpunkte der Probenwägung von Kupfer (ohne Kontakt zur Fluidoberfläche).

¬ *Diagramm 3.4: 'RawData²' -- Acquired weights during immersion and emersion (raw data and immersion corrected lengths)*



- Im Diagramm "RawData²" werden die Wägewerte zur statischen Kontaktwinkelmessung gegen die Eintauchtiefe der Probe abgebildet. Von den Roh-Wägewerten W_{RAW} wurden Proben- und Aufhängungsgewichte subtrahiert, so dass hier die *Gewichte* der Benetzungs- und Auftriebskräfte abgebildet werden ($W_{corr.}$). Die Kurvenverläufe fallen mit der Eintauchtiefe *h* (*immersion depth*) ab, indes der Volumenauftrieb des eintauchenden Probekörpers zunimmt. Im Diagramm sind Wägewerte für die advancing- und receding-Bewegung eingetragen, sowohl für nominelle (h_0) und für korrigierte Eintauchtiefen ($h_{corr.}$). Die roten Dreiecke bezeichnen die Messwerte bei $h_{corr.}$ bei der Vorwärtsbewegung (adv.), die grünen Dreiecke gehören zu Auszugsbewegungen (rec.). Durch 'CLT' (die *Constant-Level-Technic*) wird die Pegelveränderung besonders durch das ein- und austauchendes Probenvolumen simultan kompensiert, sodass die nominelle Eintauchtief mit der tatsächlichen identisch ist; die Kurven sind deshalb praktisch deckungsgleich.
Weiterhin zeigt das Diagramm noch Werte zu *negativen Eintauchtiefen*. Diese Wertepaare gehören der *Kapillarbrücke (cb = capillary bridge)* an, die sich beim Herausziehen der Probe über das Flüssigkeitsniveau deutlich ausbilden kann; besonders, wenn das Probenende scharfkantig ist.

5. ===== Table of raw data and results ======

The table below provides the data for each contact angle measuring position in this run (n=258). - Within a row the column ***t*** lists the time of the CA-measurement. $t_{eq.}$ is the duration reach the equilibrated force after positioning (static measurement). The nominal

distance between the sample bottom flatface and the liquid surface is given by h_0, whilst $h_{corr.}$ shows the corrected immersion depth- *due to CLT the values are the same*. With W_{RAW} the stabilized total weight of the sample, sample holder, wetting force and buoyancy is printed. The $W_{corr.}$-values* are former weighing values when the weight of the sample and its holder is subtracted. After buoyancy-correction, ^{a}F is the force excerted on the triple line. The Energy of Adhesion $^{a}E_{A,R} = {}^{a}F/p$ is the force of adhesion per meter of the circumference (p) of the sample. Θ is the Contact Angle. The last column indicates by **chr** the **a**dvancing resp. **r**eceding state; **cb** tags values of a '**c**apillary **b**ridge' above the surface-level.

(Resolving static force of wetting from $^{a}F = (W_{Raw}\text{-}W_0\text{-}W_{Buoy.})\cdot g + F_{Buoy.air}$) *$W_{corr.} = W_{Raw}\text{-}W_0$ (with W_0= 24,6678 g).*

Tabelle 3.5: Data table

N°	t [min]	$t_{eq.}$ [sec]	h_0 [mm]	$h_{corr.}$ [mm]	W_{RAW} [g]	$W_{corr.}$ [g]	^{a}F [mN]	$^{a}E_{A,R}$ [mN/m]	Θ [°deg]	chr --
1.	0,00	3,2	0,000	0,000	24,7181	0,0503	0,4933	19,70	0	a
2.	0,07	3,1	0,200	0,200	24,7113	0,0435	0,4941	19,73	0	a
3.	0,13	2,9	0,400	0,400	24,7044	0,0366	0,4940	19,73	0	a
4.	0,20	3,0	0,600	0,600	24,6975	0,0297	0,4938	19,72	0	a
5.	0,26	3,0	0,800	0,800	24,6906	0,0228	0,4936	19,71	0	a
6.	0,32	2,9	1,000	1,000	24,6837	0,0159	0,4935	19,71	0	a
7.	0,39	2,9	1,200	1,200	24,6768	0,0090	0,4933	19,70	0	a
8.	0,45	4,1	1,400	1,400	24,6700	0,0022	0,4941	19,73	0	a
9.	0,53	3,0	1,600	1,600	24,6632	-0,0046	0,4949	19,76	0	a
10.	0,60	2,9	1,800	1,800	24,6563	-0,0115	0,4948	19,76	0	a
11.	0,66	3,5	2,000	2,000	24,6493	-0,0185	0,4936	19,71	0	a
12.	0,73	3,0	2,200	2,200	24,6425	-0,0253	0,4945	19,75	0	a
13.	0,79	2,9	2,400	2,400	24,6356	-0,0322	0,4943	19,74	0	a
14.	0,86	3,0	2,600	2,600	24,6288	-0,0390	0,4951	19,77	0	a
15.	0,92	3,0	2,800	2,800	24,6217	-0,0461	0,4930	19,69	0	a
16.	0,99	3,7	3,000	3,000	24,6149	-0,0529	0,4938	19,72	0	a
17.	1,06	3,0	3,200	3,200	24,6079	-0,0599	0,4927	19,67	0	a
18.	1,13	3,0	3,400	3,400	24,6012	-0,0666	0,4945	19,75	0	a
19.	1,19	3,0	3,600	3,600	24,5943	-0,0735	0,4943	19,74	0	a
20.	1,25	3,0	3,800	3,800	24,5873	-0,0805	0,4932	19,69	0	a
21.	1,32	3,0	4,000	4,000	24,5805	-0,0873	0,4940	19,73	0	a
22.	1,38	3,0	4,200	4,200	24,5736	-0,0942	0,4938	19,72	0	a
23.	1,44	2,9	4,400	4,400	24,5668	-0,1010	0,4946	19,75	0	a
24.	1,50	3,0	4,600	4,600	24,5600	-0,1078	0,4954	19,78	0	a
25.	1,57	3,0	4,800	4,800	24,5531	-0,1147	0,4953	19,78	0	a
26.	1,63	3,0	5,000	5,000	24,5462	-0,1216	0,4951	19,77	0	a
27.	1,69	3,0	5,200	5,200	24,5392	-0,1286	0,4940	19,73	0	a
28.	1,76	3,0	5,400	5,400	24,5324	-0,1354	0,4948	19,76	0	a
29.	1,82	3,5	5,600	5,600	24,5256	-0,1422	0,4956	19,79	0	a
30.	1,89	3,0	5,800	5,800	24,5187	-0,1491	0,4954	19,78	0	a
31.	1,96	3,5	6,000	6,000	24,5118	-0,1560	0,4953	19,78	0	a
32.	2,03	3,2	6,200	6,200	24,5050	-0,1628	0,4961	19,81	0	a
33.	2,10	3,0	6,400	6,400	24,4980	-0,1698	0,4949	19,76	0	a
34.	2,16	3,1	6,600	6,600	24,4910	-0,1768	0,4938	19,72	0	a
35.	2,23	3,0	6,800	6,800	24,4842	-0,1836	0,4946	19,75	0	a
36.	2,29	3,0	7,000	7,000	24,4775	-0,1903	0,4964	19,82	0	a
37.	2,35	3,0	7,200	7,200	24,4705	-0,1973	0,4953	19,78	0	a
38.	2,42	2,9	7,400	7,400	24,4636	-0,2042	0,4951	19,77	0	a
39.	2,48	3,0	7,600	7,600	24,4567	-0,2111	0,4950	19,77	0	a
40.	2,54	3,1	7,800	7,800	24,4498	-0,2180	0,4948	19,76	0	a
41.	2,61	3,0	8,000	8,000	24,4430	-0,2248	0,4956	19,79	0	a
42.	2,67	2,9	8,200	8,200	24,4360	-0,2318	0,4945	19,75	0	a
43.	2,74	3,0	8,400	8,400	24,4292	-0,2386	0,4953	19,78	0	a
44.	2,80	3,0	8,600	8,600	24,4223	-0,2455	0,4951	19,77	0	a
45.	2,86	3,5	8,800	8,800	24,4155	-0,2523	0,4959	19,80	0	a
46.	2,94	3,0	9,000	9,000	24,4086	-0,2592	0,4958	19,80	0	a
47.	3,00	3,4	9,200	9,200	24,4017	-0,2661	0,4956	19,79	0	a
48.	3,07	3,0	9,400	9,400	24,3947	-0,2731	0,4945	19,75	0	a
49.	3,14	3,5	9,600	9,600	24,3879	-0,2799	0,4953	19,78	0	a
50.	3,21	3,1	9,800	9,800	24,3811	-0,2867	0,4961	19,81	0	a
51.	3,27	3,0	10,000	10,000	24,3742	-0,2936	0,4959	19,80	0	a
52.	3,34	3,0	10,200	10,200	24,3673	-0,3005	0,4958	19,80	0	a
53.	3,40	3,0	10,400	10,400	24,3603	-0,3075	0,4946	19,75	0	a
54.	3,47	2,9	10,600	10,600	24,3535	-0,3143	0,4954	19,78	0	a
55.	3,53	3,0	10,800	10,800	24,3466	-0,3212	0,4953	19,78	0	a
56.	3,60	3,0	11,000	11,000	24,3398	-0,3280	0,4961	19,81	0	a
57.	3,66	3,0	11,200	11,200	24,3329	-0,3349	0,4959	19,80	0	a
58.	3,73	3,0	11,400	11,400	24,3259	-0,3419	0,4948	19,76	0	a
59.	3,79	3,0	11,600	11,600	24,3190	-0,3488	0,4946	19,75	0	a
60.	3,85	3,0	11,800	11,800	24,3121	-0,3557	0,4945	19,75	0	a
61.	3,92	3,0	12,000	12,000	24,3052	-0,3626	0,4943	19,74	0	a
62.	3,98	2,9	12,200	12,200	24,2983	-0,3695	0,4941	19,73	0	a
63.	4,04	3,4	12,400	12,400	24,2916	-0,3762	0,4959	19,80	0	a
64.	4,12	3,1	12,600	12,600	24,2847	-0,3831	0,4958	19,80	0	a
65.	4,18	2,9	12,800	12,800	24,2778	-0,3900	0,4956	19,79	0	a
66.	4,24	3,0	13,000	13,000	24,2708	-0,3970	0,4945	19,75	0	a
67.	4,31	2,9	13,200	13,200	24,2639	-0,4039	0,4943	19,74	0	a
68.	4,37	3,0	13,400	13,400	24,2571	-0,4107	0,4951	19,77	0	a
69.	4,43	3,0	13,600	13,600	24,2504	-0,4174	0,4969	19,84	0	a
70.	4,50	3,0	13,800	13,800	24,2434	-0,4244	0,4958	19,80	0	a
71.	4,56	3,1	14,000	14,000	24,2366	-0,4312	0,4966	19,83	0	a
72.	4,63	3,0	14,200	14,200	24,2297	-0,4381	0,4964	19,82	0	a
73.	4,69	3,0	14,400	14,400	24,2227	-0,4451	0,4953	19,78	0	a
74.	4,75	2,9	14,600	14,600	24,2158	-0,4520	0,4951	19,77	0	a
75.	4,82	3,0	14,800	14,800	24,2089	-0,4589	0,4949	19,76	0	a
76.	4,88	3,4	15,000	15,000	24,2019	-0,4659	0,4938	19,72	0	a
77.	4,95	3,4	15,200	15,200	24,1951	-0,4727	0,4946	19,75	0	a
78.	5,02	4,4	15,400	15,400	24,1883	-0,4795	0,4954	19,78	0	a
79.	5,11	3,0	15,600	15,600	24,1813	-0,4865	0,4943	19,74	0	a
80.	5,17	2,9	15,800	15,800	24,1744	-0,4934	0,4941	19,73	0	a
81.	5,24	3,0	16,000	16,000	24,1675	-0,5003	0,4940	19,73	0	a
82.	5,30	3,0	16,200	16,200	24,1606	-0,5072	0,4938	19,72	0	a
83.	5,37	3,0	16,400	16,400	24,1538	-0,5140	0,4946	19,75	0	a
84.	5,43	3,0	16,600	16,600	24,1469	-0,5209	0,4945	19,75	0	a
85.	5,49	3,0	16,800	16,800	24,1399	-0,5279	0,4933	19,70	0	a
86.	5,56	3,1	17,000	17,000	24,1331	-0,5347	0,4941	19,73	0	a
87.	5,62	3,0	17,200	17,200	24,1262	-0,5416	0,4940	19,73	0	a
88.	5,69	3,0	17,400	17,400	24,1193	-0,5485	0,4938	19,72	0	a
89.	5,75	3,1	17,600	17,600	24,1124	-0,5554	0,4936	19,71	0	a

90.	5,82	3,0	17,800	17,800	24,1056	-0,5622	0,4944	19,75	0	a
91.	5,88	3,0	18,000	18,000	24,0988	-0,5690	0,4953	19,78	0	a
92.	5,94	3,0	18,200	18,200	24,0917	-0,5761	0,4931	19,69	0	a
93.	6,01	3,0	18,400	18,400	24,0850	-0,5828	0,4949	19,76	0	a
94.	6,07	3,4	18,600	18,600	24,0780	-0,5898	0,4938	19,72	0	a
95.	6,14	2,9	18,800	18,800	24,0711	-0,5967	0,4936	19,71	0	a
96.	6,21	3,0	19,000	19,000	24,0642	-0,6036	0,4935	19,71	0	a
97.	6,27	3,0	19,200	19,200	24,0574	-0,6104	0,4943	19,74	0	a
98.	6,33	2,9	19,400	19,400	24,0504	-0,6174	0,4931	19,69	0	a
99.	6,40	2,9	19,600	19,600	24,0436	-0,6242	0,4939	19,72	0	a
100.	6,46	2,9	19,800	19,800	24,0367	-0,6311	0,4938	19,72	0	a
101.	6,52	2,9	20,001	20,001	24,0298	-0,6380	0,4936	19,71	0	a
102.	*6,58*	*3,1*	*19,951*	*19,951*	*24,0316*	*-0,6362*	*0,4944*	*19,74*	*0*	*r*
103.	*6,64*	*3,0*	*19,901*	*19,901*	*24,0334*	*-0,6344*	*0,4952*	*19,78*	*0*	*r*
104.	6,70	3,0	19,851	19,851	24,0351	-0,6327	0,4950	19,77	0	r
105.	6,76	3,0	19,801	19,801	24,0368	-0,6310	0,4948	19,76	0	r
106.	6,82	2,9	19,751	19,751	24,0385	-0,6293	0,4946	19,75	0	r
107.	6,87	3,0	19,701	19,701	24,0402	-0,6276	0,4944	19,74	0	r
108.	6,93	3,5	19,651	19,651	24,0419	-0,6259	0,4942	19,73	0	r
109.	7,00	3,0	19,601	19,601	24,0437	-0,6241	0,4950	19,77	0	r
110.	7,06	3,9	19,551	19,551	24,0454	-0,6224	0,4948	19,76	0	r
111.	7,13	3,5	19,501	19,501	24,0471	-0,6207	0,4946	19,75	0	r
112.	7,20	3,0	19,451	19,451	24,0488	-0,6190	0,4943	19,74	0	r
113.	7,26	2,9	19,401	19,401	24,0505	-0,6173	0,4941	19,73	0	r
114.	7,32	3,0	19,351	19,351	24,0522	-0,6156	0,4939	19,72	0	r
115.	7,38	3,0	19,301	19,301	24,0539	-0,6139	0,4937	19,72	0	r
116.	7,44	3,0	19,251	19,251	24,0557	-0,6121	0,4945	19,75	0	r
117.	7,49	3,0	19,201	19,201	24,0574	-0,6104	0,4943	19,74	0	r
118.	7,56	3,1	19,001	19,001	24,0643	-0,6035	0,4945	19,75	0	r
119.	7,63	2,9	18,801	18,801	24,0710	-0,5968	0,4927	19,67	0	r
120.	7,69	3,0	18,601	18,601	24,0781	-0,5897	0,4948	19,76	0	r
121.	7,76	3,0	18,401	18,401	24,0849	-0,5829	0,4940	19,73	0	r
122.	7,82	3,0	18,201	18,201	24,0918	-0,5760	0,4942	19,73	0	r
123.	7,88	3,0	18,001	18,001	24,0987	-0,5691	0,4943	19,74	0	r
124.	7,95	3,0	17,801	17,801	24,1056	-0,5622	0,4945	19,75	0	r
125.	8,01	3,0	17,601	17,601	24,1125	-0,5553	0,4946	19,75	0	r
126.	8,07	3,7	17,401	17,401	24,1193	-0,5485	0,4938	19,72	0	r
127.	8,15	2,9	17,201	17,201	24,1263	-0,5415	0,4950	19,77	0	r
128.	8,21	3,0	17,001	17,001	24,1331	-0,5347	0,4942	19,73	0	r
129.	8,28	3,0	16,801	16,801	24,1401	-0,5277	0,4953	19,78	0	r
130.	8,34	3,0	16,601	16,601	24,1470	-0,5208	0,4955	19,79	0	r
131.	8,41	3,0	16,401	16,401	24,1538	-0,5140	0,4947	19,75	0	r
132.	8,47	3,0	16,201	16,201	24,1607	-0,5071	0,4948	19,76	0	r
133.	8,53	3,5	16,001	16,001	24,1676	-0,5002	0,4950	19,77	0	r
134.	8,61	4,2	15,801	15,801	24,1745	-0,4933	0,4952	19,77	0	r
135.	8,69	3,0	15,601	15,601	24,1813	-0,4865	0,4943	19,74	0	r
136.	8,76	3,0	15,401	15,401	24,1883	-0,4795	0,4955	19,79	0	r
137.	8,83	3,0	15,201	15,201	24,1951	-0,4727	0,4947	19,75	0	r
138.	8,89	3,0	15,001	15,001	24,2021	-0,4657	0,4958	19,80	0	r
139.	8,95	3,0	14,801	14,801	24,2090	-0,4588	0,4960	19,81	0	r
140.	9,02	3,0	14,601	14,601	24,2159	-0,4519	0,4961	19,81	0	r
141.	9,08	3,5	14,400	14,400	24,2229	-0,4449	0,4973	19,86	0	r
142.	9,15	2,9	14,200	14,200	24,2296	-0,4382	0,4955	19,79	0	r
143.	9,22	3,0	14,000	14,000	24,2366	-0,4312	0,4966	19,83	0	r
144.	9,28	3,0	13,800	13,800	24,2435	-0,4243	0,4968	19,84	0	r
145.	9,34	3,0	13,600	13,600	24,2503	-0,4175	0,4960	19,81	0	r
146.	9,41	3,0	13,400	13,400	24,2571	-0,4107	0,4951	19,77	0	r
147.	9,47	3,0	13,200	13,200	24,2639	-0,4039	0,4943	19,74	0	r
148.	9,54	3,0	13,000	13,000	24,2710	-0,3968	0,4965	19,83	0	r
149.	9,60	3,0	12,800	12,800	24,2779	-0,3899	0,4966	19,83	0	r
150.	9,66	3,0	12,600	12,600	24,2846	-0,3832	0,4948	19,76	0	r
151.	9,73	3,0	12,400	12,400	24,2915	-0,3763	0,4950	19,77	0	r
152.	9,79	2,9	12,200	12,200	24,2983	-0,3695	0,4942	19,73	0	r
153.	9,85	3,0	12,000	12,000	24,3051	-0,3627	0,4934	19,70	0	r
154.	9,92	3,0	11,800	11,800	24,3120	-0,3558	0,4935	19,71	0	r
155.	9,98	3,0	11,600	11,600	24,3190	-0,3488	0,4947	19,75	0	r
156.	10,05	3,1	11,400	11,400	24,3259	-0,3419	0,4948	19,76	0	r
157.	10,11	3,2	11,200	11,200	24,3326	-0,3352	0,4930	19,69	0	r
158.	10,18	3,0	11,000	11,000	24,3396	-0,3282	0,4942	19,73	0	r
159.	10,24	3,0	10,800	10,800	24,3464	-0,3214	0,4934	19,70	0	r
160.	10,31	3,0	10,600	10,600	24,3534	-0,3144	0,4945	19,75	0	r
161.	10,37	3,0	10,400	10,400	24,3602	-0,3076	0,4937	19,72	0	r
162.	10,44	3,0	10,200	10,200	24,3672	-0,3006	0,4948	19,76	0	r
163.	10,50	3,0	10,000	10,000	24,3740	-0,2938	0,4940	19,73	0	r
164.	10,57	3,0	9,800	9,800	24,3808	-0,2870	0,4932	19,69	0	r
165.	10,63	2,7	9,600	9,600	24,3878	-0,2800	0,4943	19,74	0	r
166.	10,69	3,0	9,400	9,400	24,3946	-0,2732	0,4935	19,71	0	r
167.	10,75	2,9	9,200	9,200	24,4015	-0,2663	0,4937	19,71	0	r
168.	10,82	3,0	9,000	9,000	24,4084	-0,2594	0,4938	19,72	0	r
169.	10,88	3,0	8,800	8,800	24,4153	-0,2525	0,4940	19,73	0	r
170.	10,95	3,0	8,600	8,600	24,4220	-0,2458	0,4922	19,66	0	r
171.	11,01	3,0	8,400	8,400	24,4289	-0,2389	0,4924	19,66	0	r
172.	11,07	2,9	8,200	8,200	24,4357	-0,2321	0,4916	19,63	0	r
173.	11,13	3,3	8,000	8,000	24,4427	-0,2251	0,4927	19,68	0	r
174.	11,20	3,0	7,800	7,800	24,4496	-0,2182	0,4929	19,68	0	r
175.	11,27	3,0	7,600	7,600	24,4564	-0,2114	0,4921	19,65	0	r
176.	11,33	3,0	7,400	7,400	24,4634	-0,2044	0,4932	19,70	0	r
177.	11,40	3,5	7,200	7,200	24,4701	-0,1977	0,4914	19,62	0	r
178.	11,47	3,0	7,000	7,000	24,4771	-0,1907	0,4925	19,67	0	r
179.	11,53	4,0	6,800	6,800	24,4840	-0,1838	0,4927	19,68	0	r
180.	11,61	3,0	6,600	6,600	24,4908	-0,1770	0,4919	19,64	0	r
181.	11,68	3,0	6,400	6,400	24,4977	-0,1701	0,4921	19,65	0	r
182.	11,74	3,0	6,200	6,200	24,5044	-0,1634	0,4903	19,58	0	r
183.	11,81	3,4	6,000	6,000	24,5115	-0,1563	0,4924	19,66	0	r
184.	11,88	3,0	5,800	5,800	24,5184	-0,1494	0,4926	19,67	0	r
185.	11,94	4,8	5,600	5,600	24,5252	-0,1426	0,4917	19,64	0	r
186.	12,04	3,0	5,400	5,400	24,5321	-0,1357	0,4919	19,64	0	r
187.	12,10	3,5	5,200	5,200	24,5390	-0,1288	0,4920	19,65	0	r
188.	12,18	3,0	5,000	5,000	24,5459	-0,1219	0,4922	19,66	0	r
189.	12,24	4,0	4,800	4,800	24,5528	-0,1150	0,4924	19,66	0	r
190.	12,32	3,0	4,600	4,600	24,5596	-0,1082	0,4916	19,63	0	r
191.	12,39	3,1	4,400	4,400	24,5665	-0,1013	0,4917	19,64	0	r
192.	12,45	3,1	4,200	4,200	24,5733	-0,0945	0,4909	19,60	0	r

193.	**12,52**	**3,0**	**4,000**	**4,000**	**24,5802**	**-0,0876**	**0,4911**	**19,61**	**0**	**r**
194.	**12,58**	**2,9**	**3,800**	**3,800**	**24,5871**	**-0,0807**	**0,4912**	**19,62**	**0**	**r**
195.	**12,65**	**3,1**	**3,600**	**3,600**	**24,5940**	**-0,0738**	**0,4914**	**19,62**	**0**	**r**
196.	**12,71**	**3,0**	**3,400**	**3,400**	**24,6009**	**-0,0669**	**0,4916**	**19,63**	**0**	**r**
197.	**12,77**	**3,0**	**3,200**	**3,200**	**24,6077**	**-0,0601**	**0,4908**	**19,60**	**0**	**r**
198.	**12,84**	**3,0**	**3,000**	**3,000**	**24,6147**	**-0,0531**	**0,4919**	**19,64**	**0**	**r**
199.	**12,90**	**3,0**	**2,800**	**2,800**	**24,6217**	**-0,0461**	**0,4930**	**19,69**	**0**	**r**
200.	**12,97**	**3,0**	**2,600**	**2,600**	**24,6285**	**-0,0393**	**0,4922**	**19,66**	**0**	**r**
201.	**13,03**	**3,0**	**2,400**	**2,400**	**24,6354**	**-0,0324**	**0,4924**	**19,66**	**0**	**r**
202.	**13,09**	**3,0**	**2,200**	**2,200**	**24,6423**	**-0,0255**	**0,4926**	**19,67**	**0**	**r**
203.	**13,16**	**3,2**	**2,000**	**2,000**	**24,6492**	**-0,0186**	**0,4927**	**19,68**	**0**	**r**
204.	**13,23**	**3,0**	**1,800**	**1,800**	**24,6559**	**-0,0119**	**0,4909**	**19,60**	**0**	**r**
205.	**13,29**	**3,0**	**1,600**	**1,600**	**24,6629**	**-0,0049**	**0,4921**	**19,65**	**0**	**r**
206.	**13,36**	**3,0**	**1,400**	**1,400**	**24,6697**	**0,0019**	**0,4913**	**19,62**	**0**	**r**
207.	**13,42**	**3,0**	**1,200**	**1,200**	**24,6767**	**0,0089**	**0,4924**	**19,66**	**0**	**r**
208.	**13,48**	**3,0**	**1,000**	**1,000**	**24,6836**	**0,0158**	**0,4925**	**19,67**	**0**	**r**
209.	**13,55**	**3,0**	**0,800**	**0,800**	**24,6905**	**0,0227**	**0,4927**	**19,68**	**0**	**r**
210.	**13,61**	**3,0**	**0,600**	**0,600**	**24,6974**	**0,0296**	**0,4929**	**19,68**	**0**	**r**
211.	**13,67**	**3,2**	**0,400**	**0,400**	**24,7043**	**0,0365**	**0,4930**	**19,69**	**0**	**r**
212.	**13,74**	**3,1**	**0,200**	**0,200**	**24,7110**	**0,0432**	**0,4912**	**19,62**	**0**	**r**
213.	**13,81**	**1,7**	**0,000**	**0,000**	**24,7179**	**0,0501**	**0,4911**	**19,61**	**0**	**r**
214.	**13,85**	**3,7**	**-0,050**	**-0,050**	**24,7198**	**0,0520**	**0,4928**	**19,68**	**0**	**cb**
215.	13,93	3,6	-0,100	-0,100	24,7216	0,0537	0,4932	19,69	0	cb
216.	14,00	1,6	-0,150	-0,150	24,7232	0,0554	0,4923	19,66	0	cb
217.	14,04	3,8	-0,200	-0,200	24,7249	0,0571	0,4921	19,65	0	cb
218.	14,12	4,6	-0,250	-0,250	24,7267	0,0588	0,4925	19,67	0	cb
219.	14,21	3,7	-0,300	-0,300	24,7284	0,0606	0,4927	19,68	0	cb
220.	14,29	3,7	-0,350	-0,350	24,7301	0,0623	0,4929	19,68	0	cb
221.	14,36	3,6	-0,400	-0,400	24,7319	0,0641	0,4932	19,70	0	cb
222.	14,44	3,6	-0,450	-0,450	24,7336	0,0658	0,4930	19,69	0	cb
223.	14,51	3,6	-0,500	-0,500	24,7353	0,0675	0,4928	19,68	0	cb
224.	14,58	3,7	-0,550	-0,550	24,7370	0,0692	0,4925	19,67	0	cb
225.	14,66	3,7	-0,600	-0,600	24,7388	0,0710	0,4933	19,70	0	cb
226.	14,73	3,7	-0,650	-0,650	24,7404	0,0726	0,4921	19,65	0	cb
227.	14,81	3,6	-0,700	-0,700	24,7423	0,0745	0,4938	19,72	0	cb
228.	14,88	3,7	-0,750	-0,750	24,7439	0,0761	0,4926	19,67	0	cb
229.	14,96	3,7	-0,800	-0,800	24,7456	0,0778	0,4923	19,66	0	cb
230.	15,03	3,7	-0,850	-0,850	24,7474	0,0796	0,4931	19,69	0	cb
231.	15,11	3,7	-0,900	-0,900	24,7490	0,0812	0,4920	19,65	0	cb
232.	15,18	4,3	-0,950	-0,950	24,7509	0,0831	0,4935	19,71	0	cb
233.	15,27	2,0	-1,000	-1,000	24,7526	0,0848	0,4934	19,70	0	cb
234.	15,32	3,7	-1,050	-1,050	24,7542	0,0864	0,4922	19,66	0	cb
235.	15,39	3,6	-1,100	-1,100	24,7559	0,0881	0,4920	19,65	0	cb
236.	15,47	3,6	-1,150	-1,150	24,7577	0,0899	0,4927	19,68	0	cb
237.	15,54	3,6	-1,200	-1,200	24,7594	0,0916	0,4925	19,67	0	cb
238.	15,61	3,6	-1,250	-1,250	24,7611	0,0933	0,4923	19,66	0	cb
239.	15,69	3,7	-1,300	-1,300	24,7627	0,0949	0,4911	19,61	0	cb
240.	15,76	3,6	-1,350	-1,350	24,7645	0,0967	0,4918	19,64	0	cb
241.	15,84	3,7	-1,400	-1,400	24,7662	0,0984	0,4916	19,63	0	cb
242.	15,91	3,6	-1,450	-1,450	24,7679	0,1001	0,4913	19,62	0	cb
243.	15,99	3,6	-1,500	-1,500	24,7697	0,1019	0,4921	19,65	0	cb
244.	16,06	3,6	-1,550	-1,550	24,7715	0,1037	0,4928	19,68	0	cb
245.	16,13	3,6	-1,600	-1,600	24,7732	0,1054	0,4925	19,67	0	cb
246.	16,22	2,0	-1,650	-1,650	24,7748	0,1070	0,4914	19,62	0	cb
247.	16,27	3,7	-1,700	-1,700	24,7765	0,1087	0,4912	19,62	0	cb
248.	16,35	3,7	-1,750	-1,750	24,7782	0,1104	0,4910	19,61	0	cb
249.	16,42	3,6	-1,800	-1,800	24,7799	0,1121	0,4907	19,60	0	cb
250.	16,49	3,6	-1,850	-1,850	24,7815	0,1137	0,4895	19,55	0	cb
251.	16,57	3,6	-1,900	-1,900	24,7833	0,1154	0,4900	19,57	0	cb
252.	16,64	3,6	-1,950	-1,950	24,7847	0,1169	0,4874	19,46	0	cb
253.	16,72	3,8	-2,000	-2,000	24,7865	0,1186	0,4875	19,47	0	cb
254.	16,80	3,7	-2,050	-2,050	24,7878	0,1200	0,4841	19,33	0	cb
255.	16,87	3,7	-2,100	-2,100	24,7891	0,1213	0,4799	19,17	0	cb
256.	16,95	3,6	-2,150	-2,150	24,7905	0,1227	0,4764	19,02	0	cb
257.	17,02	1,6	-2,200	-2,200	24,7915	0,1237	0,4692	18,74	2,25	cb
258.	17,06	2,4	-2,250	-2,250	24,7923	0,1245	0,4606	-	11,19	cb

Meldungen

Die Rückzugs- bzw. Receding- Bewegung ist aus 3 Zügen zusammengesetzt.

Temperaturangaben *beziehen sich auf die Skala der ITS-90.* ***Standardabweichungen:*** *Verschiedentlich werden Regressionsfunktionen mit Standardabweichungen bzw. Varianzen qualifiziert. Diese Angaben werden berechnet aus der Summe der Quadrate der Abweichungen der Einzelwerte zu jeweils berechneten Funktionswerten dividiert durch die Anzahl der Werte weniger 1. Sofern nicht anders bezeichnet, werden für ±(Standardmess-)Unsicherheiten einfache Standardabweichungen - ohne Erweiterungsfaktoren - angegeben, d.h. die Überdeckung betrifft 67% der Werte.*

IMPro Execution & Audit-Trail

Data created during execution of the IMPro *"ContactAngle_atConstantLevel, 22.05.23, 104997"*, type 4/4. Time Period of the Accomplishment: Mai., 22. 2023 between 20:11:32 and 20:35:09, elapsed time: 20 minutes. IMPro finished as projected. The complete Report first was presented on Mai., 22.23 at 20:36. Original data was changed as reported to Audit-Log:

Start of this IMPro 20:17:38, - **Backup of the IMPro configuration:**
Time **Variables**: Abs. Positions/Way: Immersion_Depth 20mm, Platform_StartPosition 85mm.
Rel. Positions/Way: FeedRateAdv 0,2mm, FeedRateRec -0,2mm, FeedRate_for_adv_rec_turn -0,050mm.
Others: Determin_0_at_Repetition -1 [Y/N].StirringTime 0s. Stirrer-Speed 0rps. Record_Air_Density -1, Temperature-Outside-Warning 0, Automatic_Thermostat_available -1.
ab 8. Wdh mit Entnahme und Abtupfung ....*
#Wilhelmy-Plate-Sequence (erstes statisch, dann speed-up dyn): 1x stat, dann v=v'*1.5 ... mm/s dyn, Beschl.g = 43 [%]: Sequ.N° 1/21: _Equi_Time: 0,350s, _Equi_Crit: 0,0001g, _Equi_loops: 5s, _Equi_loopsRepeater: 2 [n]×. Immersion_Depth: 20mm, ConditioningTime: 180s.$v_{6,05}$=75,6µL,
Measurement : CLT STATIC, PumpN°1 [n], Vol. 2,50 [cm^3], FüllVolumen 0,5 [cm^3], FreiVolumen 2 [cm^3], VolBilanz 0,424411260554242 [cm^3], PFlussRate 25,1µL/s, DichteDerFlüssigkeit 0,691902 [g/cm^3].$v_{6,15}$=-10,1µL,$v_{6,21}$=-10,1µL,$v_{6,27}$=-10,1µL,$v_{6,34}$=-10,1µL,$v_{6,40}$=-10,1µL,$v_{6,46}$=-10,1µL,$v_{6,53}$=-10,1µL,$v_{6,61}$=-10,1µL,$v_{6,67}$=-10,1

µL,$v_{6,74}$=-10,1µL,$v_{6,81}$=-10,1µL,$v_{6,87}$=-10,1µL,$v_{6,93}$=-10,1µL,$v_{7,00}$=-10,1µL,$v_{7,06}$=-10,1µL,$v_{7,14}$=-10,1µL,$v_{7,20}$=-10,1µL,$v_{7,27}$=-10,1µL,$v_{7,33}$=-10,1µL,$v_{7,39}$=-10,1µL,$v_{7,46}$=-10,1 µL,$v_{7,52}$=-10,1µL,$v_{7,58}$=-10,1µL,$v_{7,65}$=-10,1µL,$v_{7,71}$=-10,1µL,$v_{7,77}$=-10,1µL,$v_{7,84}$=-10,1µL,$v_{7,90}$=-10,1µL,$v_{7,97}$=-10,1µL,$v_{8,04}$=-10,1µL,$v_{8,11}$=-10,1µL,$v_{8,18}$=-10,1µL,$v_{8,24}$=-10,1 µL,$v_{8,31}$=-10,1µL,$v_{8,37}$=-10,1µL,$v_{8,43}$=-10,1µL,$v_{8,50}$=-10,1µL,$v_{8,56}$=-10,1µL,$v_{8,62}$=-10,1µL,$v_{8,69}$=-10,1µL,$v_{8,75}$=-10,1µL,$v_{8,82}$=-10,1µL,$v_{8,88}$=-10,1µL,$v_{8,94}$=-10,1µL,$v_{9,02}$=-10,1 µL,$v_{9,08}$=-10,1µL,$v_{9,15}$=-10,1µL,$v_{9,22}$=-10,1µL,$v_{9,29}$=-10,1µL,$v_{9,35}$=-10,1µL,$v_{9,42}$=-10,1µL,$v_{9,48}$=-10,1µL,$v_{9,55}$=-10,1µL,$v_{9,61}$=-10,1µL,$v_{9,68}$=-10,1µL,$v_{9,74}$=-10,1µL,$v_{9,81}$=-10,1 µL,$v_{9,87}$=-10,1µL,$v_{9,93}$=-10,1µL,$v_{10,00}$=-10,1µL,$v_{10,06}$=-10,1µL,$v_{10,12}$=-10,1µL,$v_{10,19}$=-10,1µL,$v_{10,26}$=-10,1µL,$v_{10,32}$=-10,1µL,$v_{10,39}$=-10,1µL,$v_{10,45}$=-10,1µL,$v_{10,51}$=-10,1µL,$v_{10,58}$ =-10,1µL,$v_{10,64}$=-10,1µL,$v_{10,70}$=-10,1µL,$v_{10,77}$=-10,1µL,$v_{10,83}$=-10,1µL,$v_{10,90}$=-10,1µL,$v_{10,96}$=-10,1µL,$v_{11,03}$=-10,1µL,$v_{11,10}$=-10,1µL,$v_{11,19}$=-10,1µL,$v_{11,25}$=-10,1µL,$v_{11,32}$=-10,1 µL,$v_{11,38}$=-10,1µL,$v_{11,44}$=-10,1µL,$v_{11,51}$=-10,1µL,$v_{11,57}$=-10,1µL,$v_{11,64}$=-10,1µL,$v_{11,70}$=-10,1µL,$v_{11,76}$=-10,1µL,$v_{11,83}$=-10,1µL,$v_{11,89}$=-10,1µL,$v_{11,96}$=-10,1µL,$v_{12,02}$=-10,1 µL,$v_{12,09}$=-10,1µL,$v_{12,15}$=-10,1µL,$v_{12,22}$=-10,1µL,$v_{12,29}$=-10,1µL,$v_{12,35}$=-10,1µL,$v_{12,41}$=-10,1µL,$v_{12,48}$=-10,1µL,$v_{12,54}$=-10,1µL,$v_{12,60}$=-10,1µL,$v_{12,66}$=2,51µL,$v_{12,72}$=2,51µL,$v_{12,78}$ =2,51µL,$v_{12,84}$=2,51µL,$v_{12,90}$=2,51µL,$v_{12,96}$=2,51µL,$v_{13,02}$=2,51µL,$v_{13,08}$=2,51µL,$v_{13,14}$=2,51µL,$v_{13,22}$=2,51µL,$v_{13,28}$=2,51µL,$v_{13,34}$=2,51µL,$v_{13,40}$=2,51µL,$v_{13,46}$=2,51µL,$v_{13,52}$= 2,51µL,$v_{13,58}$=2,51µL,$v_{13,64}$=10,1µL,$v_{13,71}$=10,1µL,$v_{13,77}$=10,1µL,$v_{13,84}$=10,1µL,$v_{13,90}$=10,1µL,$v_{13,96}$=10,1µL,$v_{14,03}$=10,1µL,$v_{14,09}$=10,1µL,$v_{14,15}$=10,1µL,$v_{14,23}$=10,1µL,$v_{14,29}$= 10,1µL,$v_{14,36}$=10,1µL,$v_{14,42}$=10,1µL,$v_{14,49}$=10,1µL,$v_{14,55}$=10,1µL,$v_{14,61}$=10,1µL,$v_{14,69}$=10,1µL,$v_{14,77}$=10,1µL,$v_{14,84}$=10,1µL,$v_{14,90}$=10,1µL,$v_{14,97}$=10,1µL,$v_{15,03}$=10,1µL,$v_{15,09}$= 10,1µL,$v_{15,16}$=10,1µL,$v_{15,23}$=10,1µL,$v_{15,30}$=10,1µL,$v_{15,36}$=10,1µL,$v_{15,42}$=10,1µL,$v_{15,49}$=10,1µL,$v_{15,55}$=10,1µL,$v_{15,61}$=10,1µL,$v_{15,68}$=10,1µL,$v_{15,74}$=10,1µL,$v_{15,81}$=10,1µL,$v_{15,87}$= 10,1µL,$v_{15,93}$=10,1µL,$v_{16,00}$=10,1µL,$v_{16,06}$=10,1µL,$v_{16,13}$=10,1µL,$v_{16,19}$=10,1µL,$v_{16,26}$=10,1µL,$v_{16,32}$=10,1µL,$v_{16,39}$=10,1µL,$v_{16,45}$=10,1µL,$v_{16,52}$=10,1µL,$v_{16,58}$=10,1µL,$v_{16,64}$= 10,1µL,$v_{16,71}$=10,1µL,$v_{16,77}$=10,1µL,$v_{16,83}$=10,1µL,$v_{16,90}$=10,1µL,$v_{16,96}$=10,1µL,$v_{17,02}$=10,1µL,$v_{17,09}$=10,1µL,$v_{17,15}$=10,1µL,$v_{17,21}$=10,1µL,$v_{17,28}$=10,1µL,$v_{17,35}$=10,1µL,$v_{17,41}$= 10,1µL,$v_{17,47}$=10,1µL,$v_{17,55}$=10,1µL,$v_{17,61}$=10,1µL,$v_{17,69}$=10,1µL,$v_{17,76}$=10,1µL,$v_{17,82}$=10,1µL,$v_{17,89}$=10,1µL,$v_{17,96}$=10,1µL,$v_{18,02}$=10,1µL,$v_{18,12}$=10,1µL,$v_{18,18}$=10,1µL,$v_{18,26}$= 10,1µL,$v_{18,32}$=10,1µL,$v_{18,40}$=10,1µL,$v_{18,47}$=10,1µL,$v_{18,53}$=10,1µL,$v_{18,60}$=10,1µL,$v_{18,66}$=10,1µL,$v_{18,72}$=10,1µL,$v_{18,79}$=10,1µL,$v_{18,85}$=10,1µL,$v_{18,92}$=10,1µL,$v_{18,98}$=10,1µL,$v_{19,05}$= 10,1µL,$v_{19,11}$=10,1µL,$v_{19,17}$=10,1µL,$v_{19,24}$=10,1µL,$v_{19,31}$=10,1µL,$v_{19,37}$=10,1µL,$v_{19,43}$=10,1µL,$v_{19,50}$=10,1µL,$v_{19,56}$=10,1µL,$v_{19,63}$=10,1µL,$v_{19,69}$=10,1µL,$v_{19,75}$=10,1µL,$v_{19,82}$= 10,1µL,$v_{19,89}$=10,1µL,$v_{19,93}$=0,289µL,$v_{20,01}$=2,75µL,$v_{20,09}$=2,54µL,$v_{20,13}$=2,36µL,$v_{20,20}$=2,47µL,$v_{20,30}$=2,54µL,$v_{20,37}$=2,51µL,$v_{20,45}$=2,51µL,$v_{20,52}$=2,54µL,$v_{20,59}$=2,46µL,$v_{20,67}$= 2,46µL,$v_{20,74}$=2,46µL,$v_{20,82}$=2,60µL,$v_{20,89}$=2,31µL,$v_{20,97}$=2,75µL,$v_{21,04}$=2,31µL,$v_{21,12}$=2,46µL,$v_{21,19}$=2,60µL,$v_{21,27}$=2,33µL,$v_{21,35}$=2,72µL,$v_{21,40}$=2,47µL,$v_{21,48}$=2,31µL,$v_{21,55}$= 2,46µL,$v_{21,62}$=2,60µL,$v_{21,70}$=2,46µL,$v_{21,77}$=2,46µL,$v_{21,85}$=2,33µL,$v_{21,92}$=2,59µL,$v_{22,00}$=2,46µL,$v_{22,07}$=2,46µL,$v_{22,14}$=2,60µL,$v_{22,22}$=2,60µL,$v_{22,31}$=2,44µL,$v_{22,35}$=2,33µL,$v_{22,43}$= 2,46µL,$v_{22,50}$=2,46µL,$v_{22,58}$=2,46µL,$v_{22,65}$=2,31µL,$v_{22,73}$=2,56µL,$v_{22,80}$=2,11µL,$v_{22,88}$=2,50µL,$v_{22,96}$=1,99µL,$v_{23,03}$=1,88µL,$v_{23,10}$=1,97µL,$v_{23,14}$=1,43µL,$v_{23,20}$=1,23µL,$v_{23,24}$= 1,14µL,$v_{23,27}$=0,679µL,$v_{23,33}$=0,434µL,$v_{23,37}$=0,0434µL,$v_{23,41}$=-0,477µL,
**** CHANGE(ES) IN DATA SHEET - by user M. Breitwieser **** Day/Time: 17.10.2025 14:29:27 ****
Remarks : from] 'Screening-Sequenz. Start /Ende mit statischer Messung *** 20:11:48 #Charaterisierung Sequenz A .
Probe mit Wasser, Tensid und viel Wasser gereinigt, abgetrocknet und mit der Messflüssigkeit auf Zellstoff abgerieben.' [to] 'Screening-Sequenz. Start /Ende mit statischer Messung *** 20:11:48 #Charaterisierung Sequenz A.
Probekörper: Blank pollierter Kupferzylinder Ø7.971mm. '
-- Reasons given for the change in the Dataset: 'mehr Klarheit'
****

The Number **22498** refers to the Recordset in the Database ***'imeterData39'*** where all Information can be retrieved at any time.

Prüfmittel

Die Kraftmesseinrichtung (WZA224) wurde 4,0 Stunden vor dieser Messung von Augsburg-Lab justiert. Die letzte vollständige Prüfung der Positioniervorrichtung von ***IMETER*** (ID23903733) erfolgte am 26.08.18. Technische Daten: Auflösung des Wägesystems 0,1 mg, Messunsicherheit (Linearität) 0,2 mg, Dichte der Justiermasse ρ_{cal} 8,00 g/cm^3, Luftdichte ρ_{air} vgl. Tabelle unten; Schwerebeschleunigung g 9,80769 m/s^2. Pt100-Temperaturmessung: Auflösung 0,001 K, Messunsicherheit ±0,01 K, $R°$ 100.0056 Ω, Kalibrierintervall 30 min (BN°1, -41/200°C, 3S, FS15,8, Korrekturfunktion: -0,0054 +0,997591·ϑ+2,20165E-05·ϑ^2-4,78431E-08·ϑ^3). Akquisitions-Softwareversion IMETER 7.4.20, LizenzN° * 3037-4759*, W. 6.2,9200- Betriebssystem auf PC Ser.N°6995684 (C, SSD).

Meteorologische Angaben, Luftdichte:

Time [min]	ϕ [%]	T_a [°C]	p_a [kPa]	ρ_{air} [kg/m^3]
0,2	46,15	24,39	95,691	1,11447

Obige Zusammenstellung gibt die Aufzeichnung der Atmosphärendaten für den Aufstellort wieder; darin bedeuten ϕ relative Luftfeuchte (r.H.), T_a Lufttemperatur und p_a absoluter Luftdruck, ρ_{air} die Luftdichte; Die Luftdichte wird dabei aus den Druck-, Temperatur- und Luftfeuchtewerten berechnet.
