

Annex A - Results Experiment 1

belonging to MSc thesis report:

Experimental and numerical analysis of a silica gel packed bed for passive humidity control in museum rooms

by

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1 | Samples

The following samples are included in Experiment 1:

No.	Name	Supplier	Type	Bulk density (kg/m ³)	Beads / Irregular	Grain size (mm)
1	SIOGEL, small pored, white	Oker-Chemie	microporous	620 - 800	Irregular	0.5 - 1.5
2	SIOGEL, small pored, white	Oker-Chemie	microporous	620 - 800	Irregular	1.0 - 3.15
3	SIOGEL, small pored, white	Oker-Chemie	microporous	620 - 800	Irregular	3.0 - 6.0
4	SIOGEL, small pored, white	Oker-Chemie	microporous	680 - 780	Beads	0.5 - 1.5
5	SIOGEL, small pored, white	Oker-Chemie	microporous	680 - 780	Beads	1.0 - 3.15
6	SIOGEL, small pored, white	Oker-Chemie	microporous	680 - 780	Beads	2.5 - 4.0
7	SIOGEL, wide pored, white	Oker-Chemie	macroporous	380 - 450	Irregular	1.5 - 3.15
8	SIOGEL, wide pored, white	Oker-Chemie	macroporous	380 - 450	Irregular	5.0 - 8.0
9	SIOGEL, wide pored, white	Oker-Chemie	macroporous	350 - 500	Beads	1.5 - 2.5
10	SIOGEL, wide pored, white, <i>cracked beads</i>	Oker-Chemie	microporous	700 - 820	Cracked beads	1.0 - 3.0
11	SIOGEL, mesoporous, white	Oker-Chemie	mesoporous	500 - 600	Irregular	1.5 - 3.15
12	Silica Gel White	DDC	microporous	720	Beads	3.0 - 5.0
13	Silica Gel Orange	DDC	microporous	720	Beads	3.0 - 5.0
14	PROSorb	Long Life for Art	microporous	750	Beads	± 3 - 5

Table 1.1: Silica gel types included in Experiment 1

2 | Results Experiment 1

2.1 Step: 20 to 30 %RH

The obtained data for a step from 20 to 30 %RH:

Raw data

	Mon 29/11 12:00	Wed 1/12 09:30	Wed 1/12 11:45	Wed 1/12 14:00	Wed 1/12 16:30	Thu 2/12 09:00	Thu 2/12 11:15	Thu 2/12 12:45	
RH setpoint [%RH]	RH setpoint [%RH]	20	30	30	30	30	30	30	
RH measured [%RH]	RH measured [%RH]	20,5	30,7	30,5	30,5	30,6	30,6	30,6	
T measured [C]	T measured [C]	21,8	21,8	21,8	21,8	21,7	21,7	21,7	
Time [h]	Time [h]	0,00	2,25	4,50	7,00	23,50	25,75	27,25	
Sample no.	Mass sample loaded [g] total - container								FINAL DM/DT [g/h]
1	19,819	22,011	22,308	22,529	22,680	23,066	23,081	23,090	
2	19,649	21,897	22,191	22,357	22,514	22,933	22,950	22,962	+0,006
3	25,878	28,717	29,117	29,326	29,524	30,000	30,017	30,029	+0,008
4	17,229	19,064	19,328	19,475	19,611	19,963	19,978	19,985	+0,005
5	18,325	20,283	20,577	20,758	20,905	21,257	21,267	21,274	+0,005
6	18,489	20,537	20,847	21,027	21,164	21,502	21,516	21,520	+0,003
7	13,314	13,360	13,451	13,476	13,489	13,494	13,492	13,491	-0,001
8	18,019	18,309	18,427	18,448	18,456	18,458	18,457	18,457	+0,000
9	15,769	16,354	16,494	16,550	16,597	16,673	16,670	16,669	-0,001
10	27,319	30,459	30,808	31,037	31,234	31,891	31,934	31,959	+0,017
11	16,759	17,456	17,609	17,674	17,724	17,806	17,806	17,806	+0,000
12	23,691	26,088	26,409	26,622	26,80	27,25	27,28	27,30	+0,01
13	22,500	24,637	24,950	25,141	25,310	25,810	25,824	25,838	+0,009
14	23,131	19,913	20,134	20,249	20,337	20,534	20,540	20,545	+0,003
Empty	0,000	-0,020	-0,018	-0,020	-0,020	-0,020	-0,021	-0,020	+0,001

Figure 2.1: Mass of samples for a step from 20 to 30 %RH.

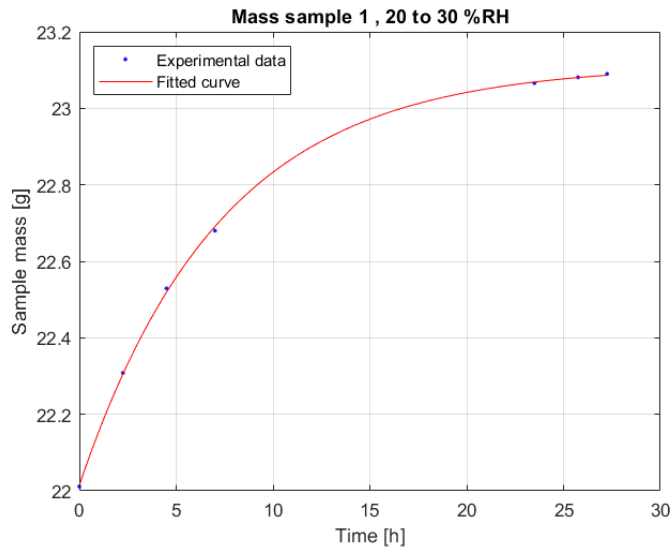
Sample 1:

Figure 2.2: fitted curve

SSE	2.58e-04
R-Square	1.000
DFE	4
Adjusted R-Square	1.000
RMSE	0.008
a	1.099
c	22.014
End value	23.113
b	0.137

Table 2.1: Goodness of Fit

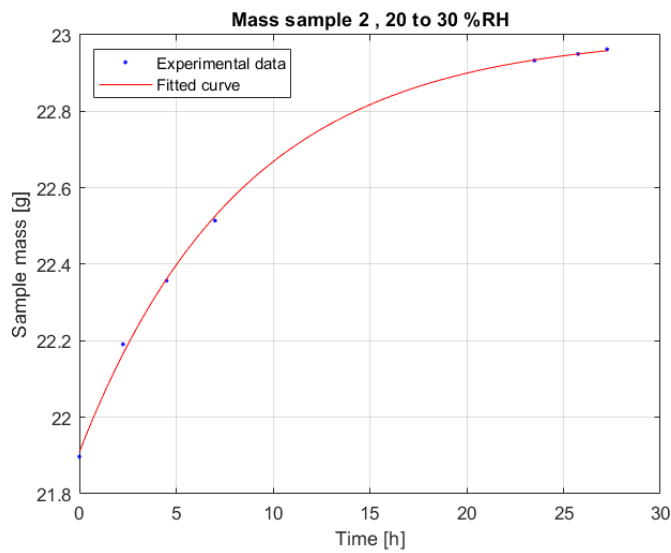
Sample 2:

Figure 2.3: fitted curve

SSE	9.81e-04
R-Square	0.999
DFE	4
Adjusted R-Square	0.999
RMSE	0.016
a	1.092
c	21.909
End value	23.001
b	0.119

Table 2.2: Goodness of Fit

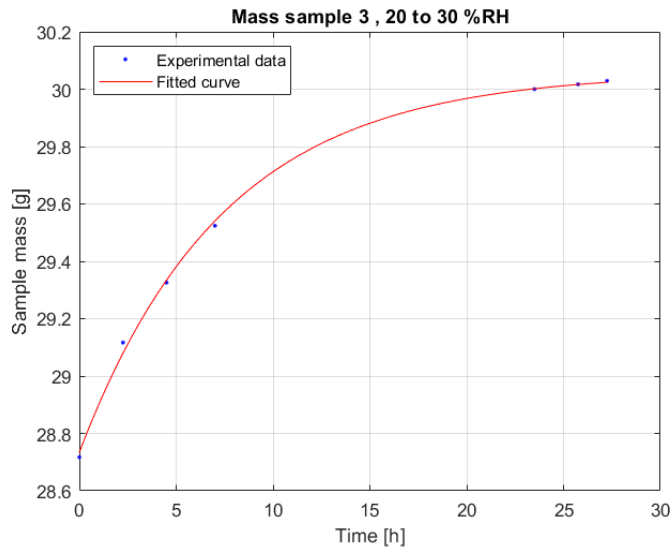
Sample 3:

Figure 2.4: fitted curve

SSE	0.00210
R-Square	0.999
DFE	4
Adjusted R-Square	0.998
RMSE	0.023
a	1.324
c	28.734
End value	30.058
b	0.137

Table 2.3: Goodness of Fit

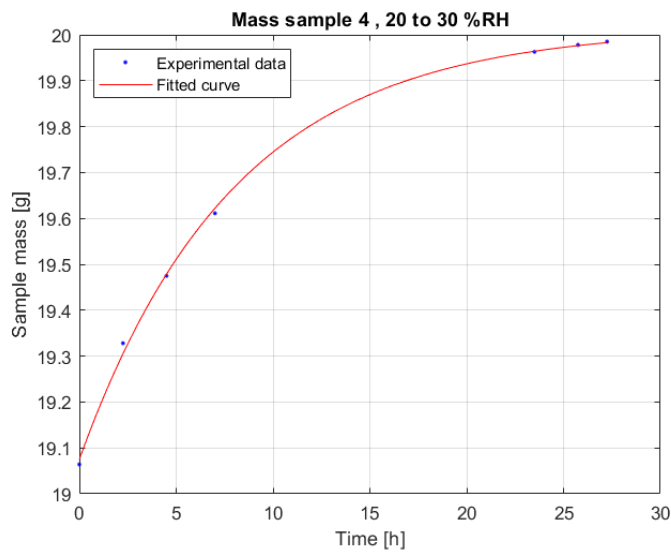
Sample 4:

Figure 2.5: fitted curve

SSE	7.98e-04
R-Square	0.999
DFE	4
Adjusted R-Square	0.998
RMSE	0.014
a	0.939
c	19.075
End value	20.014
b	0.125

Table 2.4: Goodness of Fit

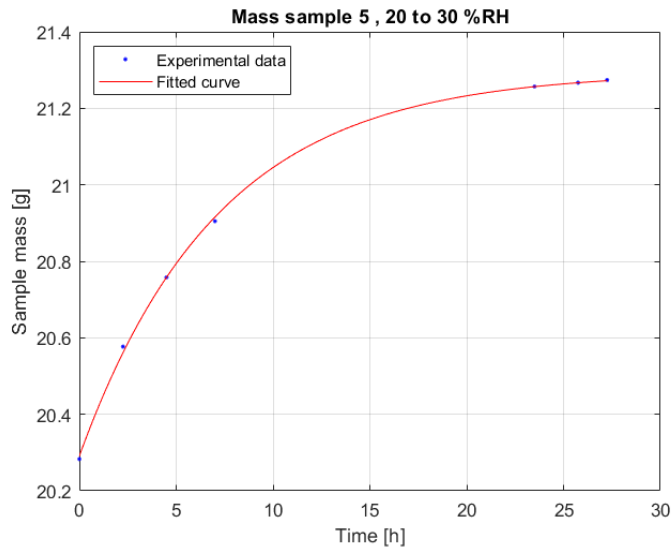
Sample 5:

Figure 2.6: fitted curve

SSE	4.46e-04
R-Square	1.000
DFE	4
Adjusted R-Square	0.999
RMSE	0.011
a	1.004
c	20.291
End value	21.295
b	0.139

Table 2.5: Goodness of Fit

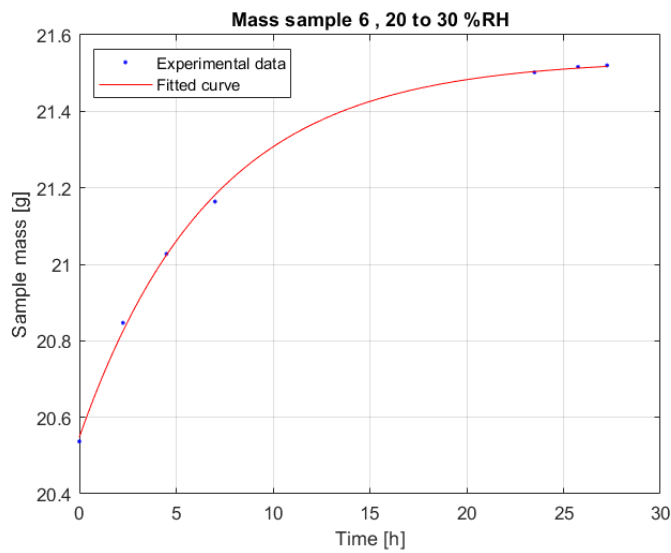
Sample 6:

Figure 2.7: fitted curve

SSE	9.20e-04
R-Square	0.999
DFE	4
Adjusted R-Square	0.998
RMSE	0.015
a	0.988
c	20.548
End value	21.536
b	0.146

Table 2.6: Goodness of Fit

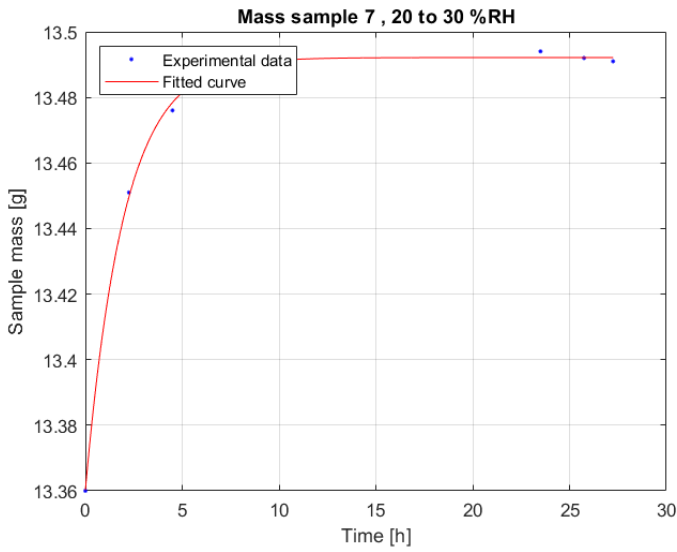
Sample 7:

Figure 2.8: fitted curve

SSE	1.32e-05
R-Square	0.999
DFE	4
Adjusted R-Square	0.999
RMSE	0.002
a	0.132
c	13.360
End value	13.492
b	0.503

Table 2.7: Goodness of Fit

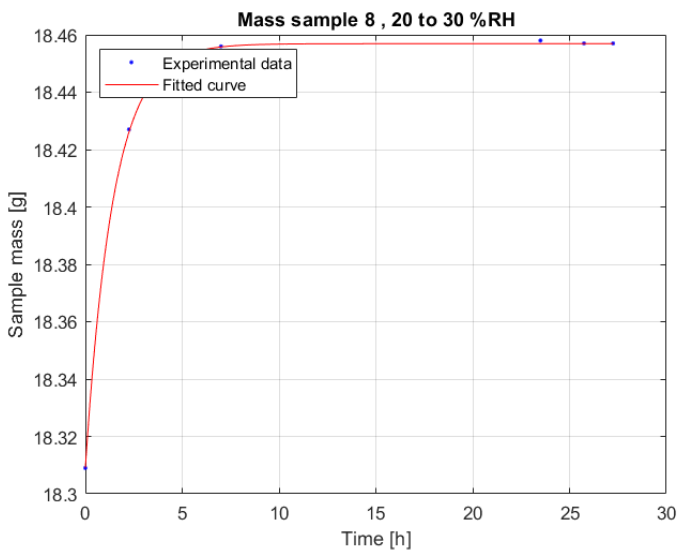
Sample 8:

Figure 2.9: fitted curve

SSE	8.25e-06
R-Square	1.000
DFE	4
Adjusted R-Square	0.999
RMSE	0.001
a	0.148
c	18.309
End value	18.457
b	0.695

Table 2.8: Goodness of Fit

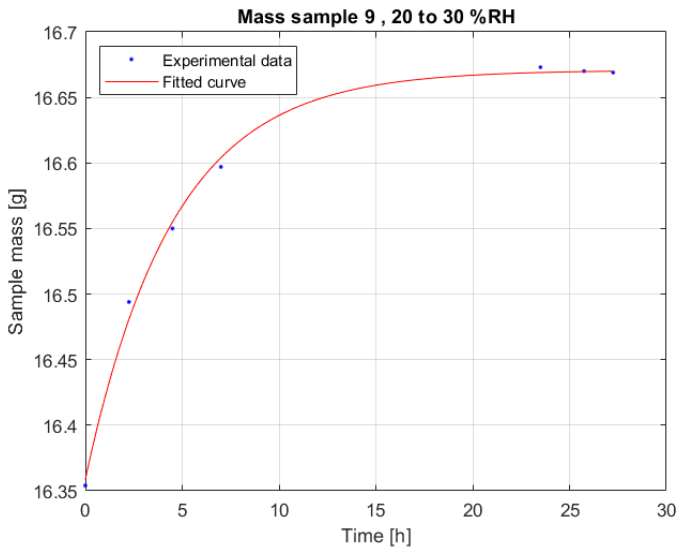
Sample 9:

Figure 2.10: fitted curve

SSE	2.91e-04
R-Square	0.997
DFE	4
Adjusted R-Square	0.995
RMSE	0.009
a	0.312
c	16.359
End value	16.671
b	0.220

Table 2.9: Goodness of Fit

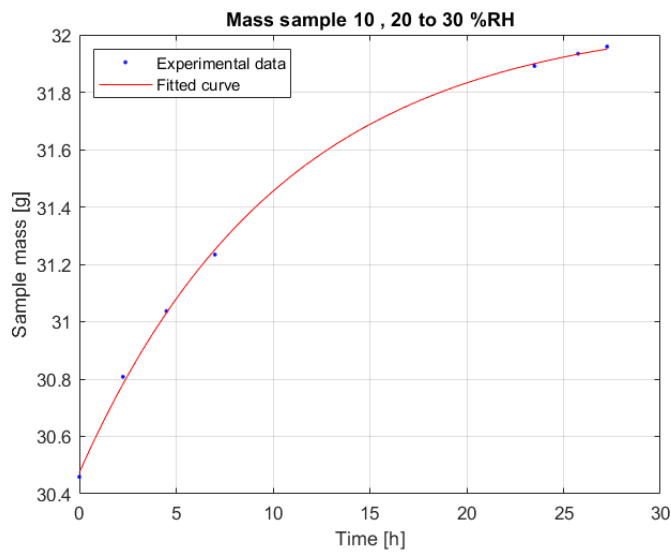
Sample 10:

Figure 2.11: fitted curve

SSE	1.37e-03
R-Square	0.999
DFE	4
Adjusted R-Square	0.999
RMSE	0.019
a	1.595
c	30.474
End value	32.069
b	0.095

Table 2.10: Goodness of Fit

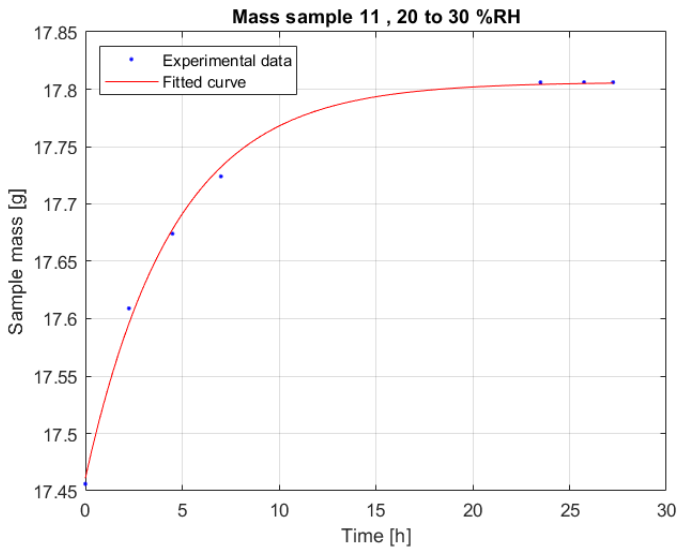
Sample 11:

Figure 2.12: fitted curve

SSE	2.87e-04
R-Square	0.997
DFE	4
Adjusted R-Square	0.996
RMSE	0.008
a	0.345
c	17.461
End value	17.806
b	0.220

Table 2.11: Goodness of Fit

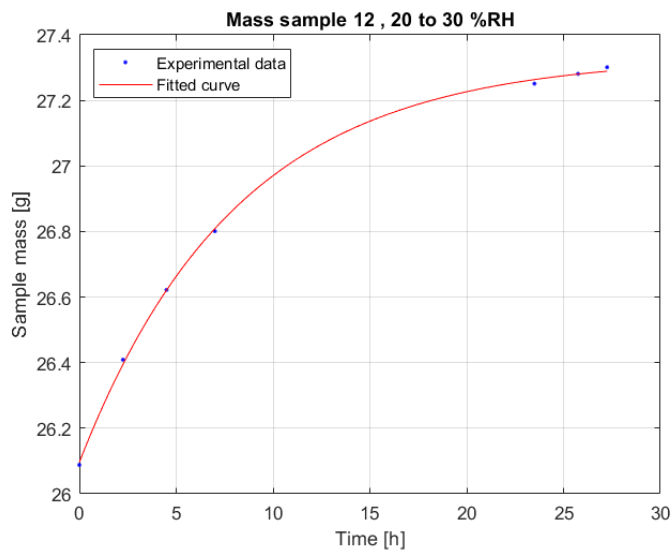
Sample 12:

Figure 2.13: fitted curve

SSE	6.42-04
R-Square	1.000
DFE	4
Adjusted R-Square	0.999
RMSE	0.013
a	1.237
c	26.096
End value	27.333
b	0.123

Table 2.12: Goodness of Fit

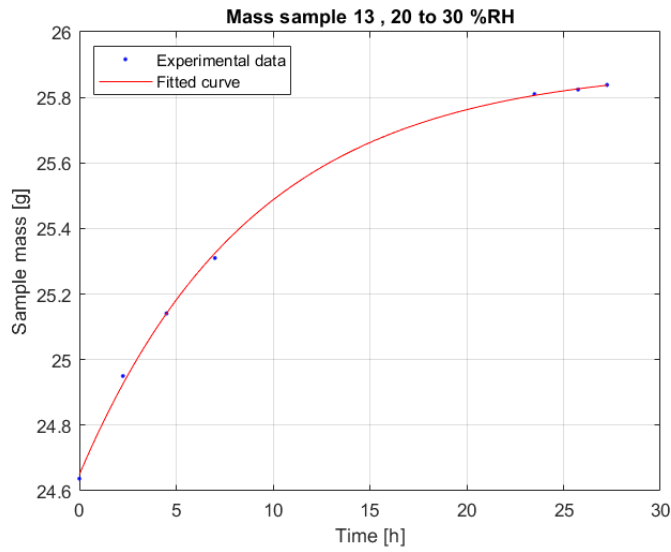
Sample 13:

Figure 2.14: fitted curve

SSE	9.76e-04
R-Square	0.999
DFE	4
Adjusted R-Square	0.999
RMSE	0.016
a	1.248
c	24.649
End value	25.897
b	0.111

Table 2.13: Goodness of Fit

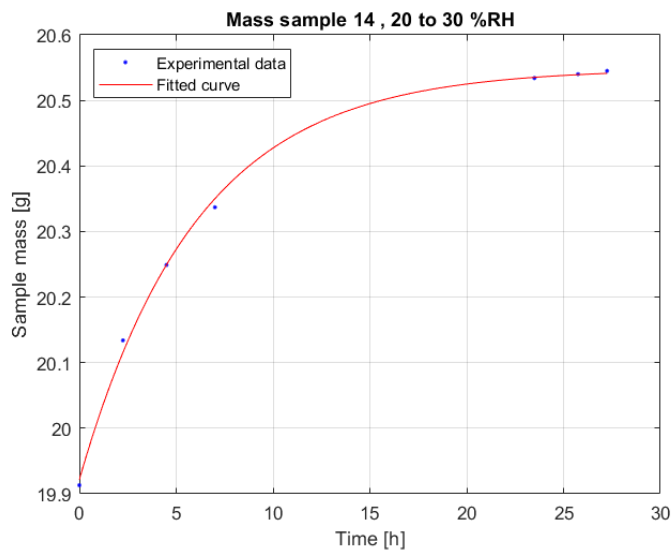
Sample 14:

Figure 2.15: fitted curve

SSE	6.07e-04
R-Square	0.998
DFE	4
Adjusted R-Square	0.997
RMSE	0.012
a	0.627
c	19.922
End value	20.548
b	0.164

Table 2.14: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	2,58E-04	1,000	4	1,000	0,008	22,014	1,099	23,113	0,137
2	9,81E-04	0,999	4	0,999	0,016	21,909	1,092	23,001	0,119
3	2,10E-03	0,999	4	0,998	0,023	28,734	1,324	30,058	0,134
4	7,98E-04	0,999	4	0,998	0,014	19,075	0,939	20,014	0,125
5	4,46E-04	1,000	4	0,999	0,011	20,291	1,004	21,295	0,139
6	9,20E-04	0,999	4	0,998	0,015	20,548	0,988	21,536	0,146
7	1,32E-05	0,999	4	0,999	0,002	13,360	0,132	13,492	0,503
8	8,25E-06	1,000	4	0,999	0,001	18,309	0,148	18,457	0,695
9	2,91E-04	0,997	4	0,995	0,009	16,359	0,312	16,671	0,220
10	1,37E-03	0,999	4	0,999	0,019	30,474	1,595	32,069	0,095
11	2,87E-04	0,997	4	0,996	0,008	17,461	0,345	17,806	0,220
12	6,42E-04	1,000	4	0,999	0,013	26,096	1,237	27,333	0,123
13	9,76E-04	0,999	4	0,999	0,016	24,649	1,248	25,897	0,111
14	6,07E-04	0,998	4	0,997	0,012	19,922	0,627	20,548	0,164

Figure 2.16: Goodness of Fit and final values for step 20 to 30 %RH.

2.2 Step: 30 to 40 %RH

The obtained data for a step from 30 to 40 %RH:

Raw data

	Thu 2/12 13:00	Thu 2/12 14:45	Thu 2/12 17:00	Fri 3/12 09:30	Fri 3/12 12:45	Fri 3/12 15:30	
RH setpoint [%RH]	30	40	40	40	40	40	
RH measured [%RH]	30,6	41,1	40,6	40,8	40,7	40,6	
T measured [C]	21,7	21,7	21,7	21,7	21,7	21,7	
Time [h]	0,00	1,45	4,00	20,50	23,75	26,50	
Sample no.							
							FINAL DM/DT [g/h]
1	23,090	23,412	23,611	24,173	24,206	24,229	
		+0,322	+0,199	+0,562	+0,033	+0,023	+0,008
2	22,962	23,300	23,515	24,122	24,162	24,187	
		+0,338	+0,215	+0,607	+0,040	+0,025	+0,009
3	30,029	30,482	30,771	31,545	31,596	31,633	
		+0,453	+0,289	+0,774	+0,051	+0,037	+0,013
4	19,985	20,278	20,469	21,002	21,035	21,057	
		+0,293	+0,191	+0,533	+0,033	+0,022	+0,008
5	21,274	21,602	21,811	22,368	22,396	22,421	
		+0,328	+0,209	+0,557	+0,028	+0,025	+0,009
6	21,520	21,858	22,075	22,629	22,656	22,677	
		+0,338	+0,217	+0,554	+0,027	+0,021	+0,008
7	13,491	13,592	13,620	13,651	13,651	13,656	
		+0,101	+0,028	+0,031	+0,000	+0,005	+0,002
8	18,457	18,594	18,609	18,621	18,624	18,627	
		+0,137	+0,015	+0,012	+0,003	+0,003	+0,001
9	16,669	16,824	16,896	17,089	17,099	17,109	
		+0,155	+0,072	+0,193	+0,010	+0,010	+0,004
10	31,959	32,343	32,590	33,438	33,502	33,551	
		+0,384	+0,247	+0,848	+0,064	+0,049	+0,018
11	17,806	17,981	18,061	18,253	18,262	18,270	
		+0,175	+0,080	+0,192	+0,009	+0,008	+0,003
12	27,30	27,68	27,92	28,63	28,69	28,74	
		+0,38	+0,24	+0,71	+0,06	+0,05	+0,02
13	25,838	26,211	26,481	27,140	27,175	27,205	
		+0,373	+0,270	+0,659	+0,035	+0,030	+0,011
14	20,545	20,822	20,980	21,384	21,403	21,419	
		+0,277	+0,158	+0,404	+0,019	+0,016	+0,006
Empty	-0,020	-0,020	-0,021	-0,021	-0,019	-0,018	
		+0,000	-0,001	+0,000	+0,002	+0,001	+0,000

Figure 2.17: Mass of samples for a step from 30 to 40 %RH.

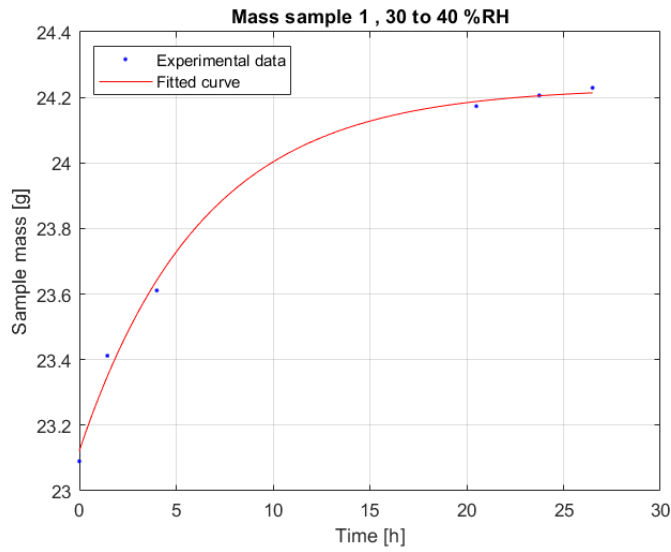
Sample 1:

Figure 2.18: fitted curve

SSE	6.35e-03
R-Square	0.995
DFE	3
Adjusted R-Square	0.991
RMSE	0.046
a	1.108
c	23.122
End value	24.231
b	0.158

Table 2.15: Goodness of Fit

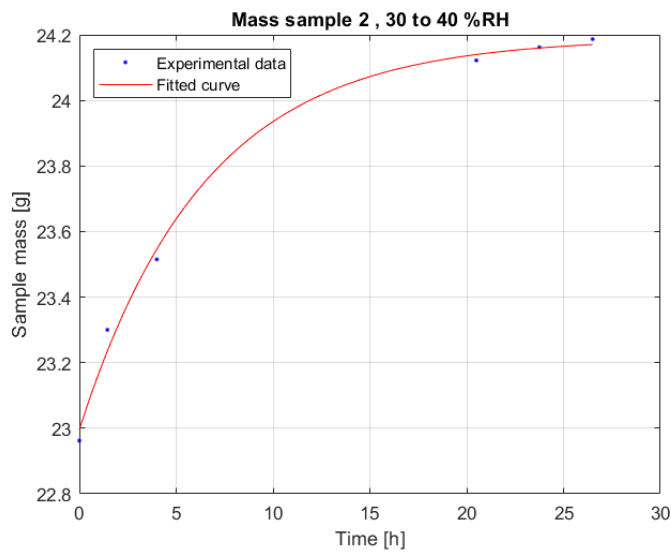
Sample 2:

Figure 2.19: fitted curve

SSE	6.89e-03
R-Square	0.995
DFE	3
Adjusted R-Square	0.992
RMSE	0.048
a	1.194
c	22.996
End value	24.190
b	0.154

Table 2.16: Goodness of Fit

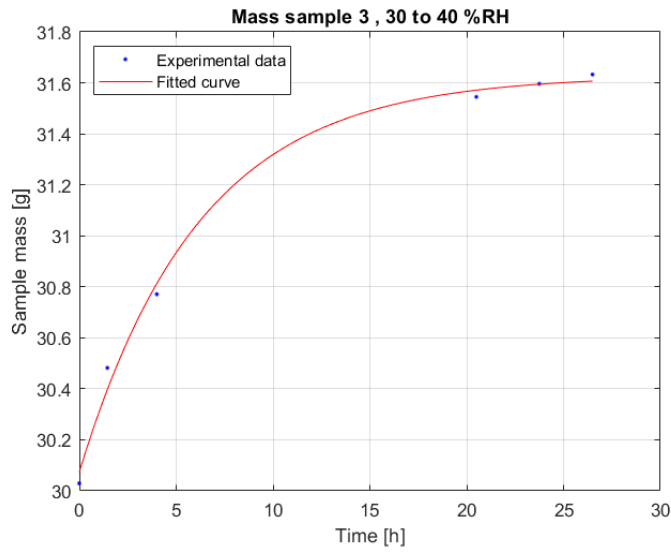
Sample 3:

Figure 2.20: fitted curve

SSE	1.22e-02
R-Square	0.995
DFE	3
Adjusted R-Square	0.991
RMSE	0.064
a	1.555
c	30.073
End value	31.628
b	0.161

Table 2.17: Goodness of Fit

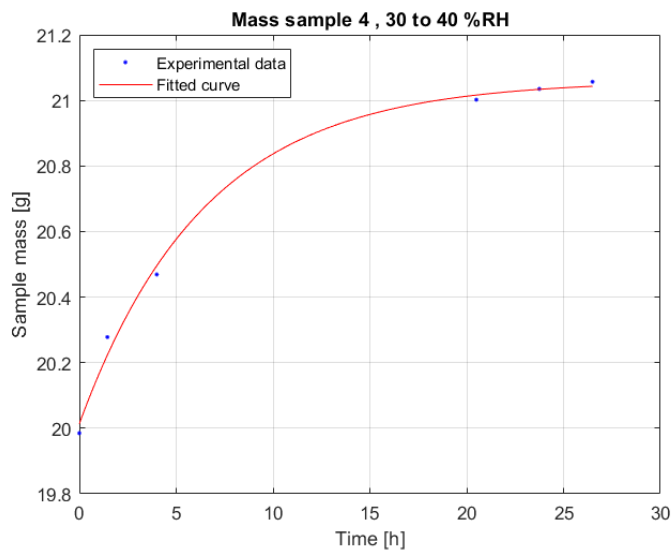
Sample 4:

Figure 2.21: fitted curve

SSE	4.91e-03
R-Square	0.995
DFE	3
Adjusted R-Square	0.992
RMSE	0.040
a	1.047
c	20.014
End value	21.061
b	0.154

Table 2.18: Goodness of Fit

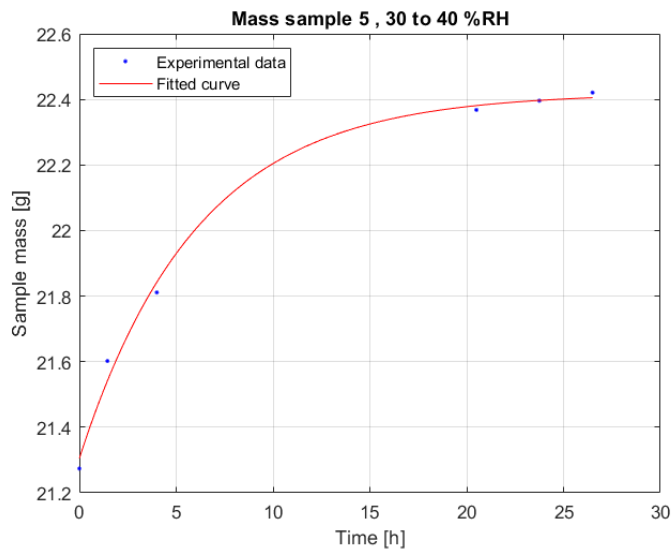
Sample 5:

Figure 2.22: fitted curve

SSE	6.03e-03
R-Square	0.995
DFE	3
Adjusted R-Square	0.992
RMSE	0.045
a	1.114
c	21.305
End value	22.419
b	0.164

Table 2.19: Goodness of Fit

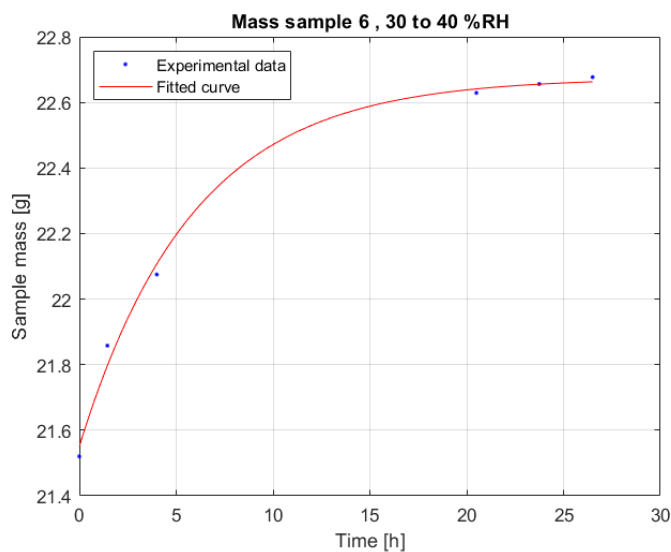
Sample 6:

Figure 2.23: fitted curve

SSE	6.01e-03
R-Square	0.995
DFE	3
Adjusted R-Square	0.992
RMSE	0.045
a	1.124
c	21.551
End value	22.675
b	0.171

Table 2.20: Goodness of Fit

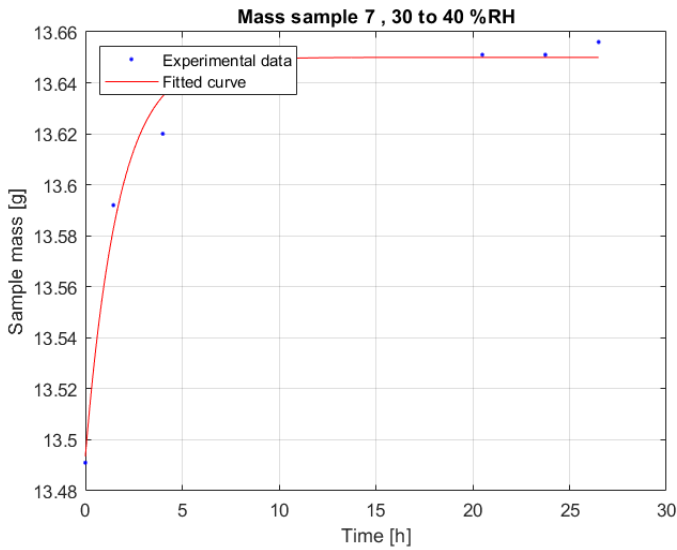
Sample 7:

Figure 2.24: fitted curve

SSE	3.48e-04
R-Square	0.983
DFE	3
Adjusted R-Square	0.971
RMSE	0.011
a	0.156
c	13.494
End value	13.650
b	0.583

Table 2.21: Goodness of Fit

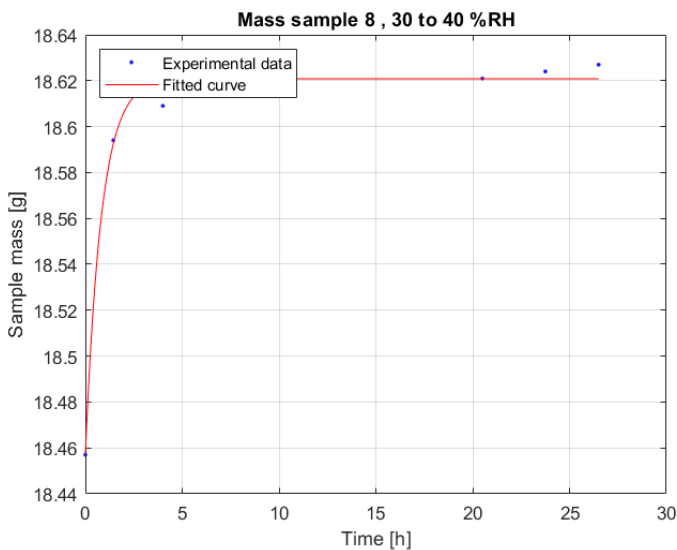
Sample 8:

Figure 2.25: fitted curve

SSE	1.61e-04
R-Square	0.993
DFE	3
Adjusted R-Square	0.988
RMSE	0.007
a	0.164
c	18.457
End value	18.621
b	1.213

Table 2.22: Goodness of Fit

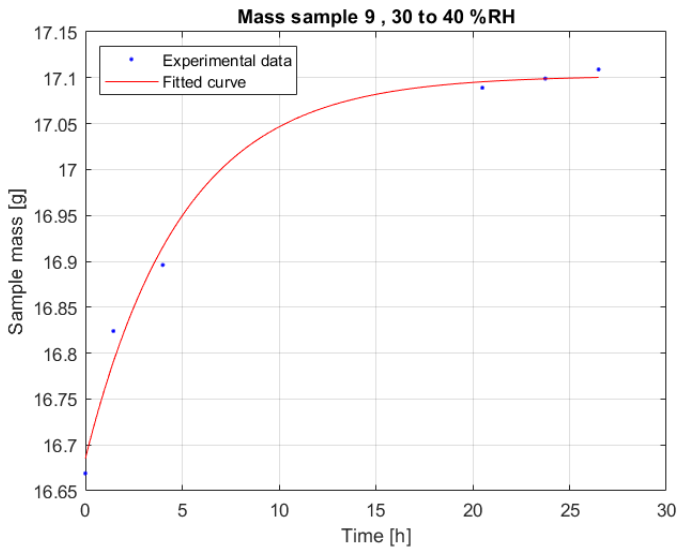
Sample 9:

Figure 2.26: fitted curve

SSE	1.88e-03
R-Square	0.989
DFE	3
Adjusted R-Square	0.981
RMSE	0.025
a	0.417
c	16.685
End value	17.102
b	0.201

Table 2.23: Goodness of Fit

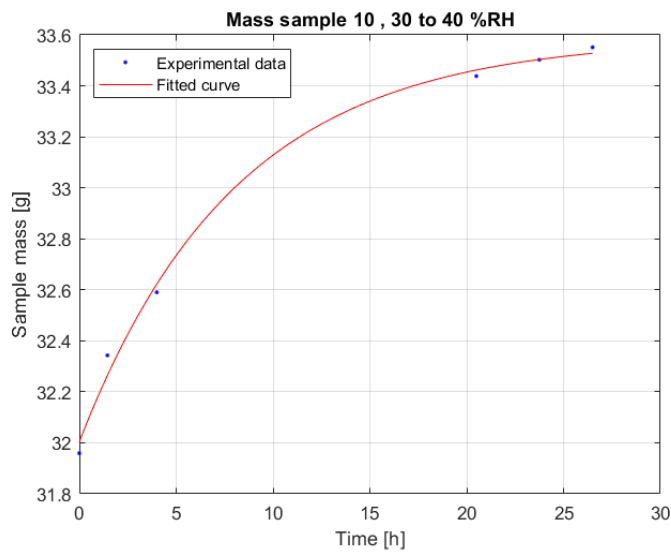
Sample 10:

Figure 2.27: fitted curve

SSE	1.04e-02
R-Square	0.996
DFE	3
Adjusted R-Square	0.993
RMSE	0.059
a	1.583
c	32.004
End value	33.587
b	0.124

Table 2.24: Goodness of Fit

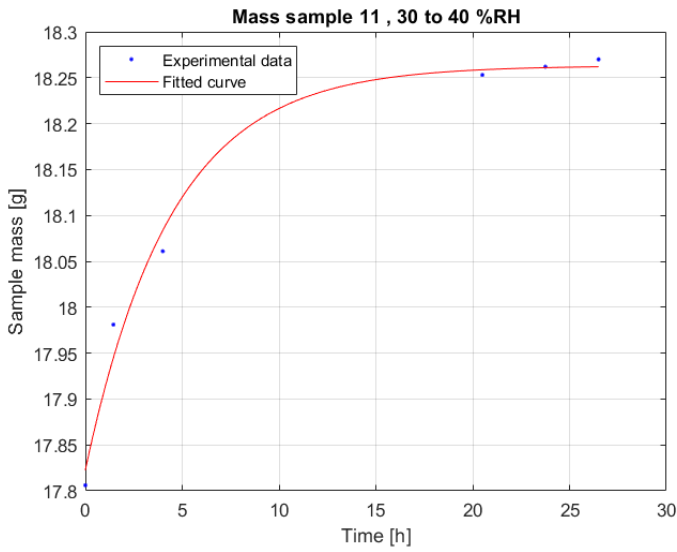
Sample 11:

Figure 2.28: fitted curve

SSE	2.18e-03
R-Square	0.988
DFE	3
Adjusted R-Square	0.980
RMSE	0.027
a	0.440
c	17.823
End value	18.263
b	0.225

Table 2.25: Goodness of Fit

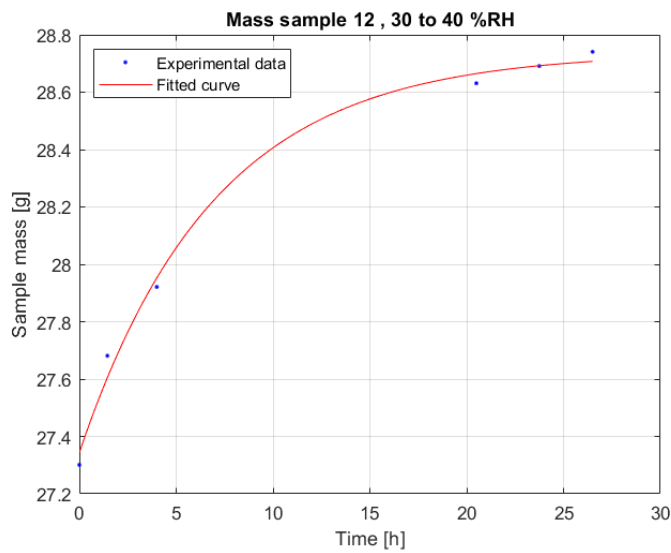
Sample 12:

Figure 2.29: fitted curve

SSE	1.08-02
R-Square	0.994
DFE	3
Adjusted R-Square	0.990
RMSE	0.060
a	1.395
c	27.343
End value	28.739
b	0.143

Table 2.26: Goodness of Fit

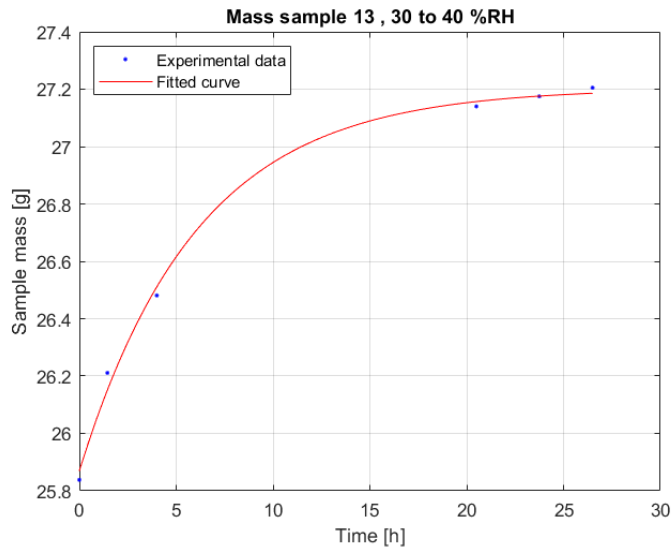
Sample 13:

Figure 2.30: fitted curve

SSE	6.06e-03
R-Square	0.996
DFE	3
Adjusted R-Square	0.994
RMSE	0.045
a	1.334
c	25.869
End value	27.203
b	0.164

Table 2.27: Goodness of Fit

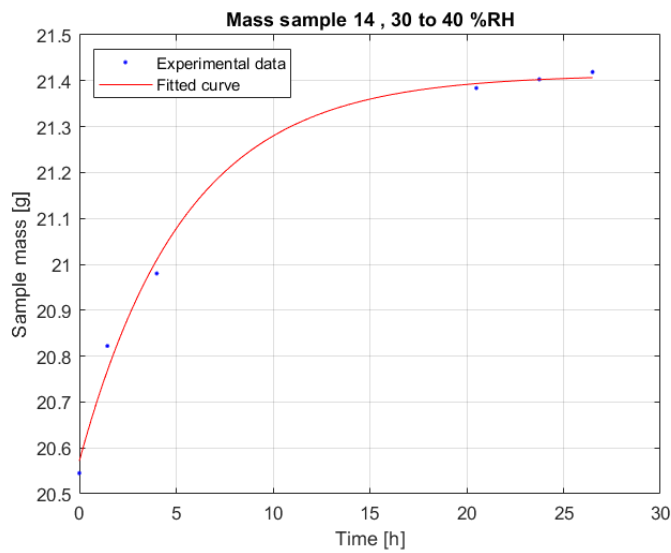
Sample 14:

Figure 2.31: fitted curve

SSE	4.70e-03
R-Square	0.993
DFE	3
Adjusted R-Square	0.988
RMSE	0.040
a	0.040
c	20.571
End value	21.413
b	0.184

Table 2.28: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	6,35E-03	0,995	3	0,991	0,046	23,122	1,108	24,231	0,158
2	6,89E-03	0,995	3	0,992	0,048	22,996	1,194	24,190	0,154
3	1,22E-02	0,995	3	0,991	0,064	30,073	1,555	31,628	0,161
4	4,91E-03	0,995	3	0,992	0,040	20,014	1,047	21,061	0,154
5	6,03E-03	0,995	3	0,992	0,045	21,305	1,114	22,419	0,164
6	6,01E-03	0,995	3	0,992	0,045	21,551	1,124	22,675	0,171
7	3,48E-04	0,983	3	0,971	0,011	13,494	0,156	13,650	0,583
8	1,61E-04	0,993	3	0,988	0,007	18,457	0,164	18,621	1,213
9	1,88E-03	0,989	3	0,981	0,025	16,685	0,417	17,102	0,201
10	1,04E-02	0,996	3	0,993	0,059	32,004	1,583	33,587	0,124
11	2,18E-03	0,988	3	0,980	0,027	17,823	0,440	18,263	0,225
12	1,08E-02	0,994	3	0,990	0,060	27,343	1,395	28,739	0,143
13	6,06E-03	0,996	3	0,994	0,045	25,869	1,334	27,203	0,164
14	4,70E-03	0,993	3	0,988	0,040	20,571	0,842	21,413	0,184

Figure 2.32: Goodness of Fit and final values for step 30 to 40 %RH.

2.3 Step: 40 to 50 %RH

The obtained data for a step from 40 to 50 %RH:

Raw data

	Fri 3/12 15:45	Fri 3/12 17:15	Mon 6/12 08:45	Mon 6/12 09:45	
RH setpoint [%RH]	40	50	50	50	
RH measured [%RH]	40,6	50,6	50,6	50,7	
T measured [C]	21,7	21,7	21,7	21,7	
Time [h]	0,00	1,50	65,00	66,00	
Sample no.					
					FINAL DM/DT [g/h]
1	24,229	24,513	25,279	25,268	
		+0,284	+0,766	-0,011	-0,011
2	24,187	24,496	25,346	25,331	
		+0,309	+0,850	-0,015	-0,015
3	31,633	32,050	33,429	33,415	
		+0,417	+1,379	-0,014	-0,014
4	21,057	21,320	22,121	22,105	
		+0,263	+0,801	-0,016	-0,016
5	22,421	22,717	23,538	23,522	
		+0,296	+0,821	-0,016	-0,016
6	22,677	22,982	23,810	23,797	
		+0,305	+0,828	-0,013	-0,013
7	13,656	13,750	13,846	13,833	
		+0,094	+0,096	-0,013	-0,013
8	18,627	18,752	18,837	18,824	
		+0,125	+0,085	-0,013	-0,013
9	17,109	17,269	17,810	17,796	
		+0,160	+0,541	-0,014	-0,014
10	33,551	33,856	34,96	34,94	
		+0,305	+1,11	-0,02	-0,02
11	18,270	18,453	18,965	18,963	
		+0,183	+0,512	-0,002	-0,002
12	28,74	29,07	30,32	30,32	
		+0,33	+1,25	+0,00	+0,00
13	27,205	27,527	28,550	28,539	
		+0,322	+1,023	-0,011	-0,011
14	21,419	21,678	22,521	22,512	
		+0,259	+0,843	-0,009	-0,009
Empty	-0,018	-0,020	-0,020	-0,020	
		-0,002	+0,000	+0,000	+0,000

Figure 2.33: Mass of samples for a step from 40 to 50 %RH.

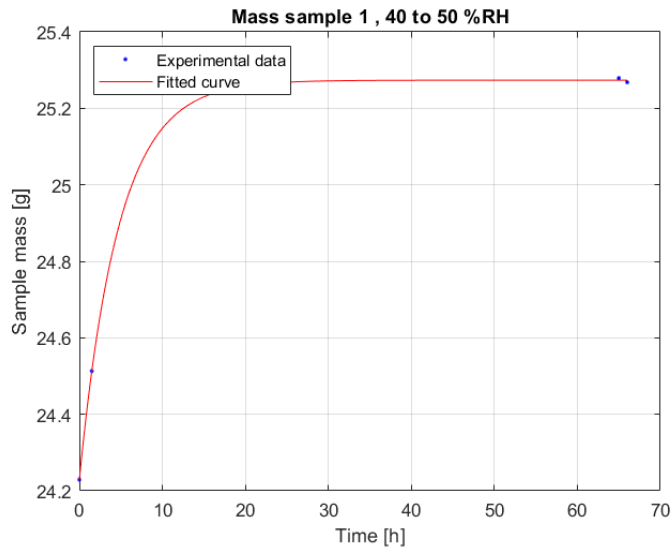
Sample 1:

Figure 2.34: fitted curve

SSE	6.05e-05
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.008
a	1.045
c	24.229
End value	25.274
b	0.212

Table 2.29: Goodness of Fit

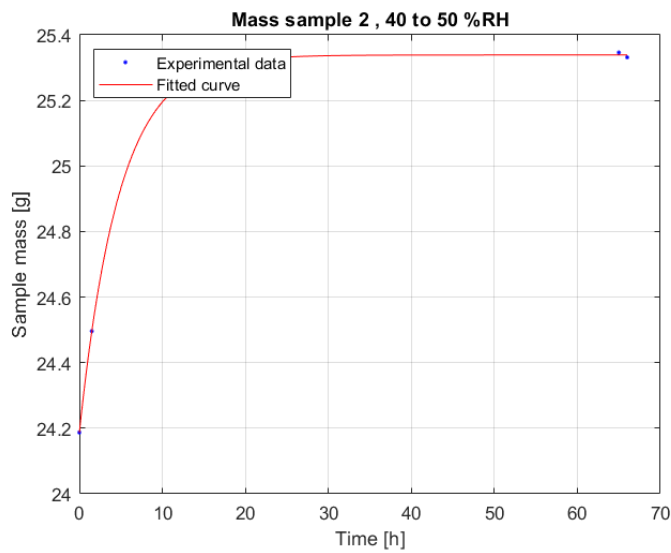
Sample 2:

Figure 2.35: fitted curve

SSE	1.13e-04
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.011
a	1.152
c	24.187
End value	25.339
b	0.208

Table 2.30: Goodness of Fit

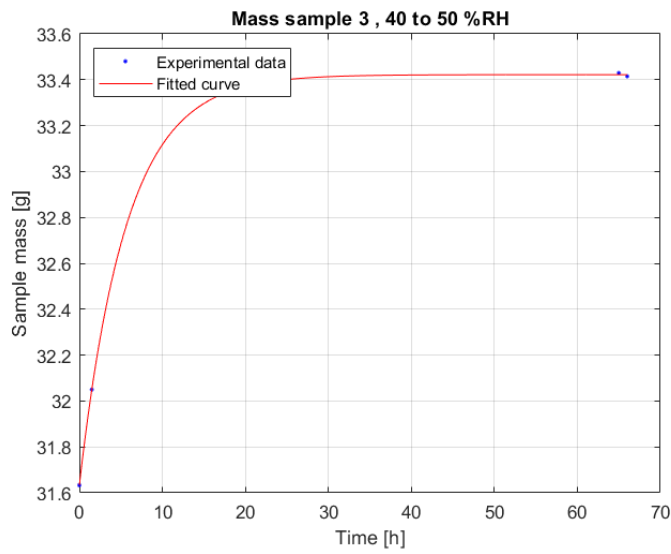
Sample 3:

Figure 2.36: fitted curve

SSE	9.80e-05
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.010
a	1.789
c	31.633
End value	33.422
b	0.177

Table 2.31: Goodness of Fit

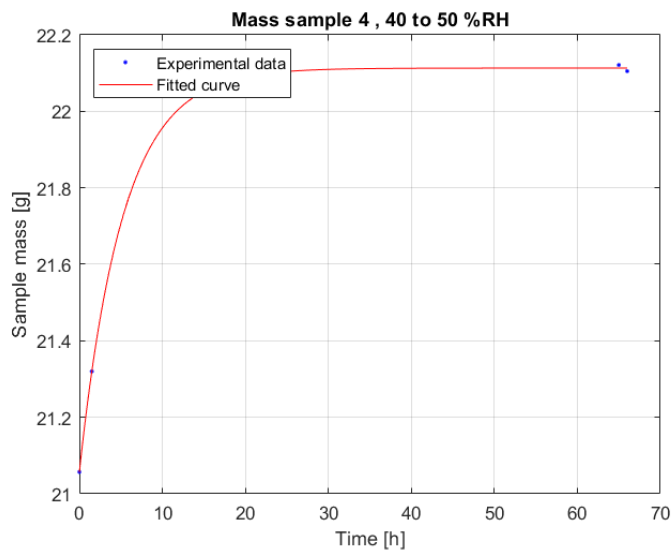
Sample 4:

Figure 2.37: fitted curve

SSE	1.28e-04
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.011
a	1.056
c	21.057
End value	22.113
b	0.191

Table 2.32: Goodness of Fit

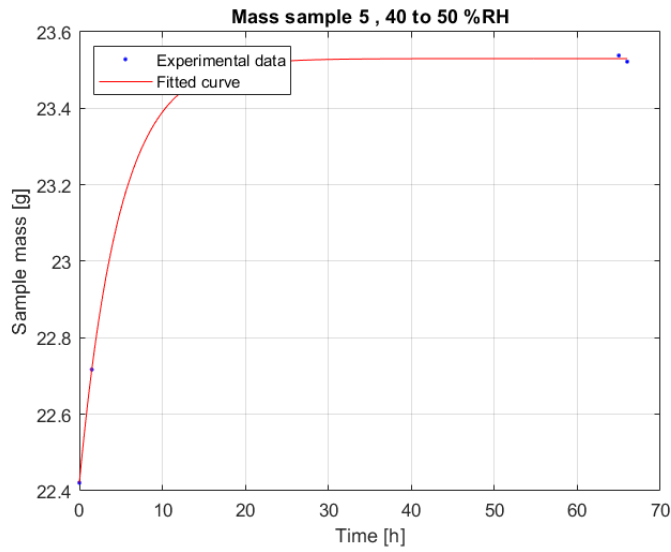
Sample 5:

Figure 2.38: fitted curve

SSE	1.28e-04
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.011
a	1.109
c	22.421
End value	23.530
b	0.207

Table 2.33: Goodness of Fit

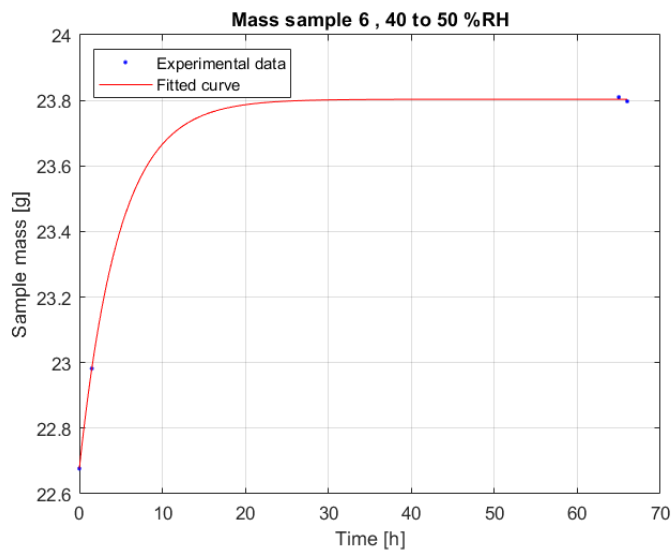
Sample 6:

Figure 2.39: fitted curve

SSE	8.45e-05
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.009
a	1.127
c	22.677
End value	23.804
b	0.210

Table 2.34: Goodness of Fit

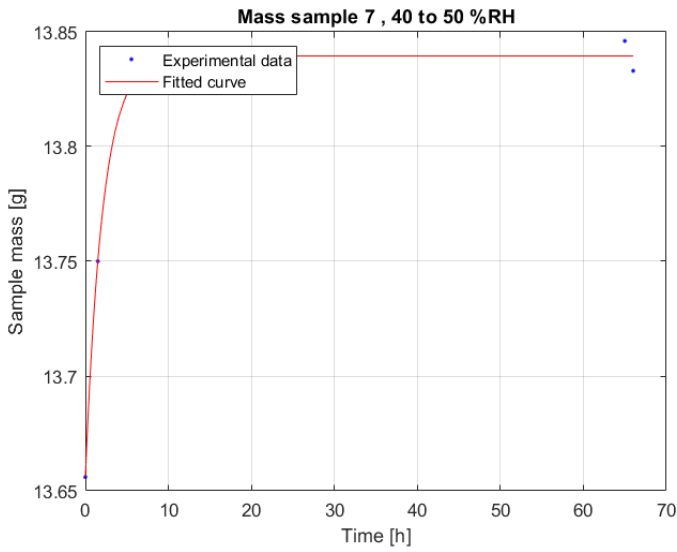
Sample 7:

Figure 2.40: fitted curve

SSE	8.45e-05
R-Square	0.996
DFE	1
Adjusted R-Square	0.989
RMSE	0.009
a	0.184
c	13.656
End value	13.840
b	0.479

Table 2.35: Goodness of Fit

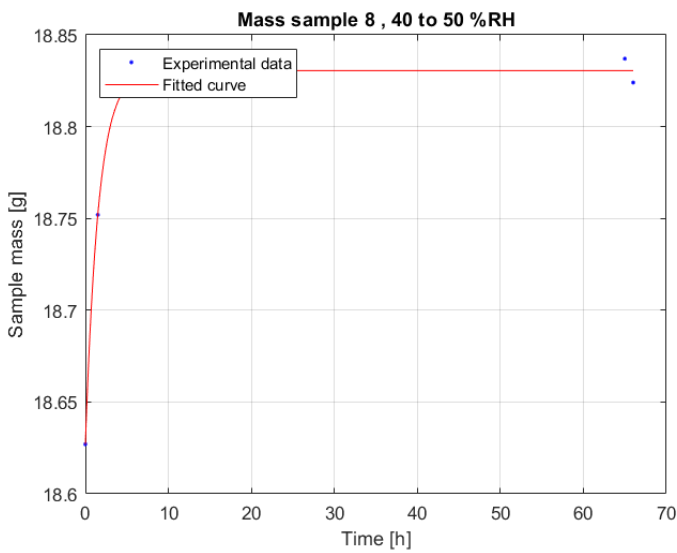
Sample 8:

Figure 2.41: fitted curve

SSE	8.45e-05
R-Square	0.997
DFE	1
Adjusted R-Square	0.991
RMSE	0.009
a	0.204
c	18.627
End value	18.831
b	0.635

Table 2.36: Goodness of Fit

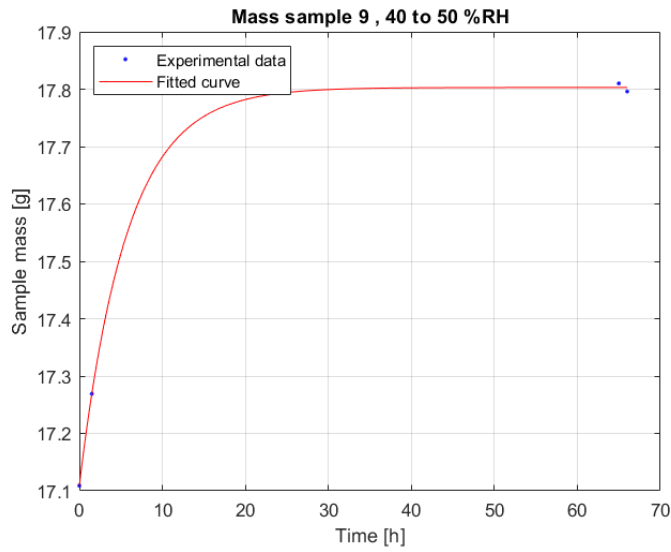
Sample 9:

Figure 2.42: fitted curve

SSE	9.80e-05
R-Square	1.000
DFE	1
Adjusted R-Square	0.999
RMSE	0.010
a	0.694
c	17.109
End value	17.803
b	0.175

Table 2.37: Goodness of Fit

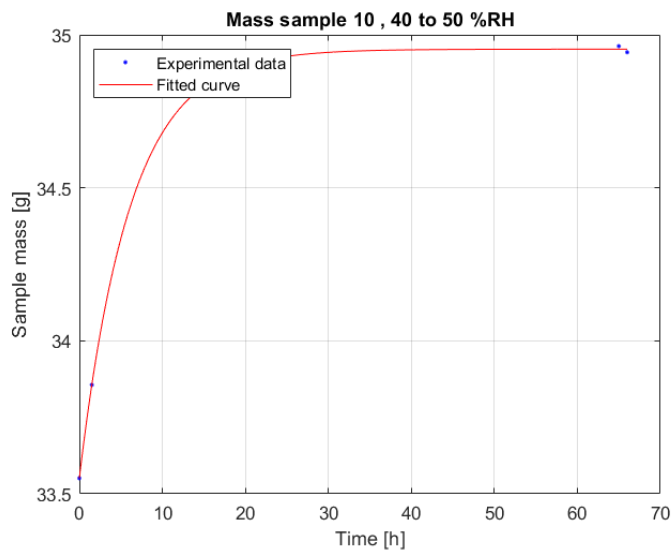
Sample 10:

Figure 2.43: fitted curve

SSE	2.00e-04
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.014
a	0.1402
c	33.551
End value	34.953
b	0.164

Table 2.38: Goodness of Fit

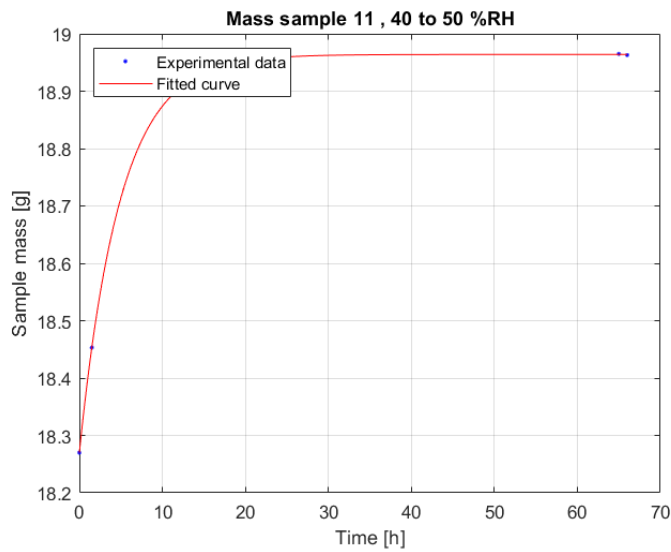
Sample 11:

Figure 2.44: fitted curve

SSE	2.00e-06
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.001
a	0.694
c	18.270
End value	18.964
b	0.204

Table 2.39: Goodness of Fit

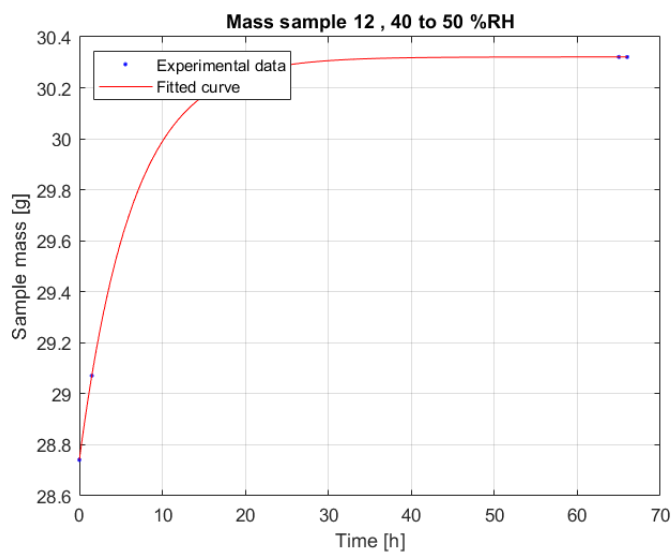
Sample 12:

Figure 2.45: fitted curve

SSE	3.97-11
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.000
a	1.580
c	28.741
End value	30.321
b	0.156

Table 2.40: Goodness of Fit

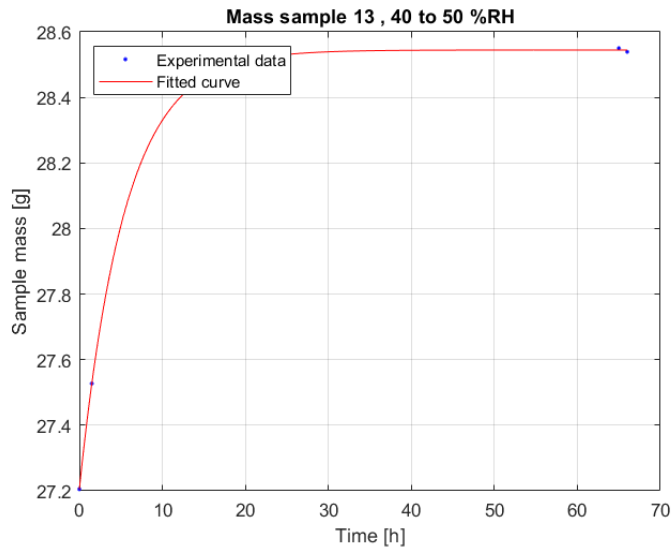
Sample 13:

Figure 2.46: fitted curve

SSE	6.05e-05
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.008
a	1.340
c	27.205
End value	28.545
b	0.183

Table 2.41: Goodness of Fit

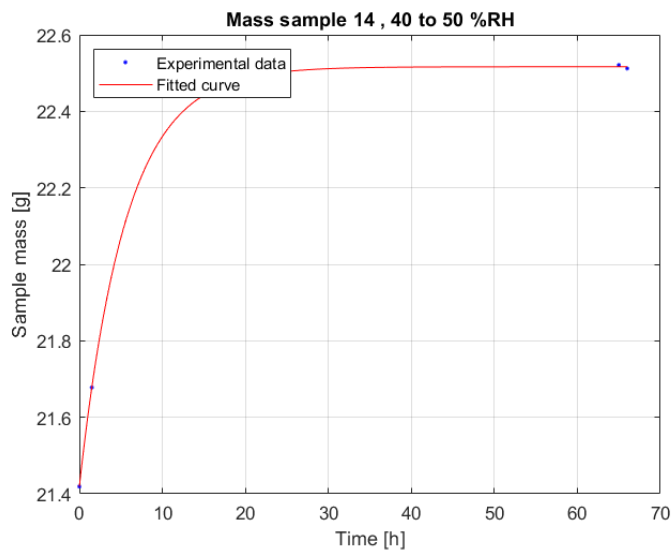
Sample 14:

Figure 2.47: fitted curve

SSE	4.05e-05
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.006
a	1.098
c	21.419
End value	22.517
b	0.179

Table 2.42: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	6,05E-05	1,000	1	1,000	0,008	24,229	1,045	25,274	0,212
2	1,13E-04	1,000	1	1,000	0,011	24,187	1,152	25,339	0,208
3	9,80E-05	1,000	1	1,000	0,010	31,633	1,789	33,422	0,177
4	1,28E-04	1,000	1	1,000	0,011	21,057	1,056	22,113	0,191
5	1,28E-04	1,000	1	1,000	0,011	22,421	1,109	23,530	0,207
6	8,45E-05	1,000	1	1,000	0,009	22,677	1,127	23,804	0,210
7	8,45E-05	0,996	1	0,989	0,009	13,656	0,184	13,840	0,479
8	8,45E-05	0,997	1	0,991	0,009	18,627	0,204	18,831	0,635
9	9,80E-05	1,000	1	0,999	0,010	17,109	0,694	17,803	0,175
10	2,00E-04	1,000	1	1,000	0,014	33,551	1,402	34,953	0,164
11	2,00E-06	1,000	1	1,000	0,001	18,270	0,694	18,964	0,204
12	3,97E-11	1,000	1	1,000	0,000	28,741	1,580	30,321	0,156
13	6,05E-05	1,000	1	1,000	0,008	27,205	1,340	28,545	0,183
14	4,05E-05	1,000	1	1,000	0,006	21,419	1,098	22,517	0,179

Figure 2.48: Goodness of Fit and final values for step 40 to 50 %RH.

2.4 Step: 50 to 60 %RH

The obtained data for a step from 50 to 60 %RH:

Raw data

	Mon 6/12 10:00	Mon 6/12 12:45	Mon 6/12 15:00	Tue 7/12 09:00	Tue 7/12 12:15	
RH setpoint [%RH]	50	60	60	60	60	
RH measured [%RH]	50,6	60,5	60,4	60,4	60,4	
T measured [C]	21,7	21,7	21,7	21,7	21,7	
Time [h]	0,00	2,75	5,00	23,00	26,25	
Sample no.						
						FINAL DM/DT [g/h]
1	25,268	25,629	25,770	25,960	25,959	-0,001
2	25,331	25,721	25,877	26,089	26,089	+0,000
3	33,415	34,012	34,289	34,854	34,863	+0,003
4	22,105	22,452	22,606	22,825	22,827	+0,001
5	23,522	23,905	24,070	24,277	24,279	+0,001
6	23,797	24,204	24,374	24,587	24,590	+0,001
7	13,833	13,999	14,048	14,127	14,131	+0,001
8	18,824	19,041	19,085	19,143	19,145	+0,001
9	17,796	18,088	18,231	18,740	18,780	+0,012
10	34,94	35,31	35,46	35,73	35,73	+0,00
11	18,963	19,289	19,439	19,963	20,001	+0,012
12	30,32	30,76	30,96	31,43	31,44	+0,00
13	28,539	28,958	29,133	29,411	29,414	+0,001
14	22,512	22,933	23,140	23,715	23,739	+0,007
Empty	-0,020	-0,020	-0,021	-0,020	-0,020	+0,000

Figure 2.49: Mass of samples for a step from 50 to 60 %RH.

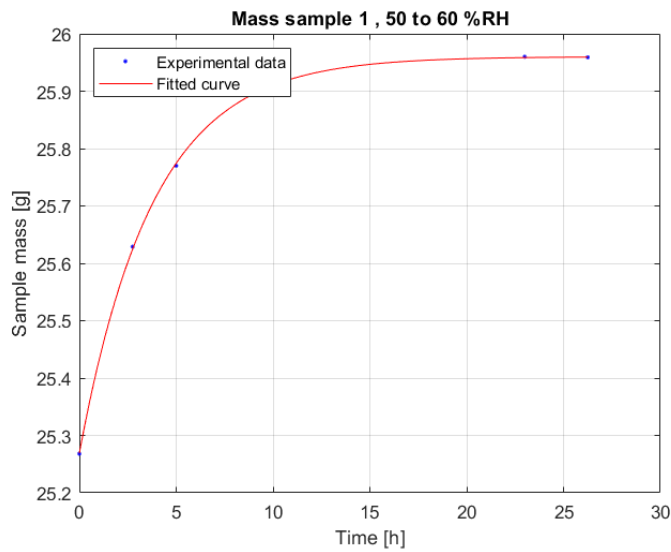
Sample 1:

Figure 2.50: fitted curve

SSE	4.19e-05
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.005
a	0.691
c	25.269
End value	25.960
b	0.263

Table 2.43: Goodness of Fit

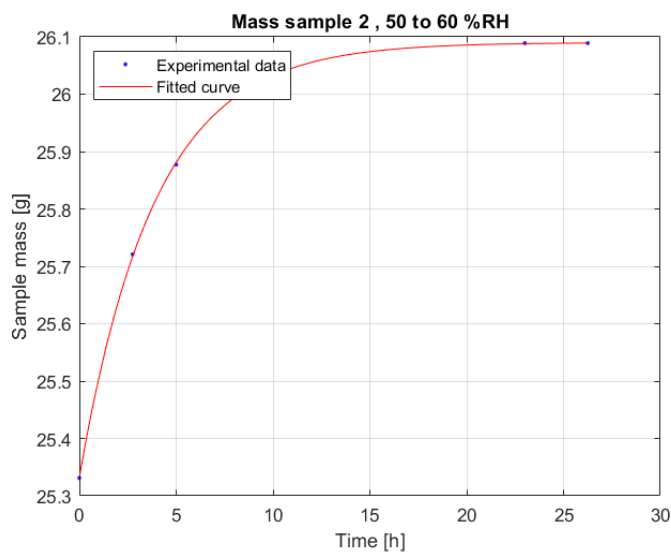
Sample 2:

Figure 2.51: fitted curve

SSE	3.56e-05
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.004
a	0.758
c	25.332
End value	25.090
b	0.258

Table 2.44: Goodness of Fit

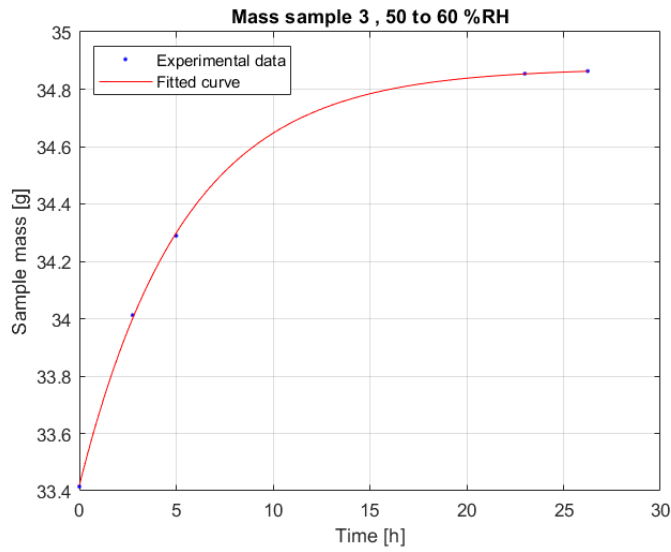
Sample 3:

Figure 2.52: fitted curve

SSE	2.40e-04
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.011
a	1.455
c	33.418
End value	34.873
b	0.186

Table 2.45: Goodness of Fit

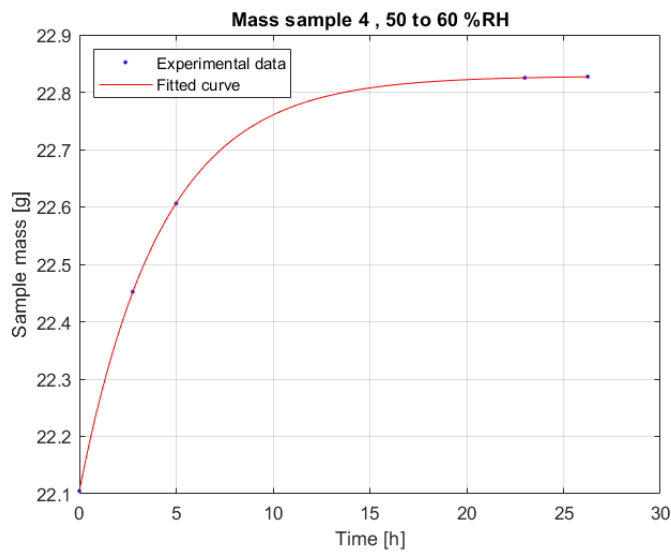
Sample 4:

Figure 2.53: fitted curve

SSE	1.56e-06
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.001
a	0.723
c	22.105
End value	22.828
b	0.237

Table 2.46: Goodness of Fit

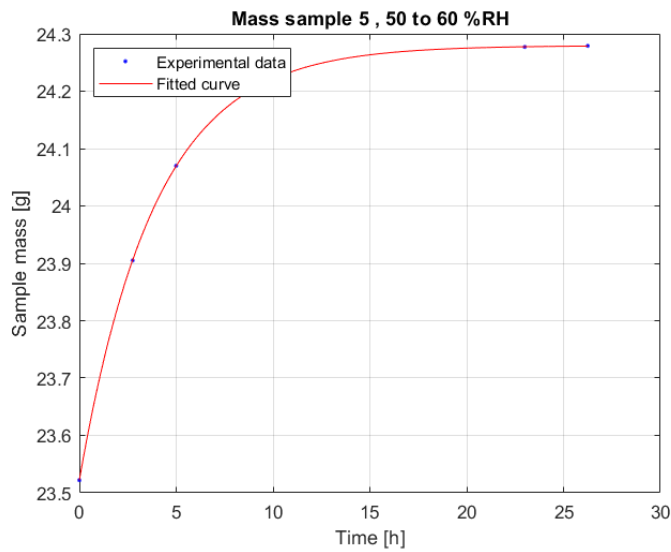
Sample 5:

Figure 2.54: fitted curve

SSE	7.71e-07
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.001
a	0.758
c	23.522
End value	24.280
b	0.257

Table 2.47: Goodness of Fit

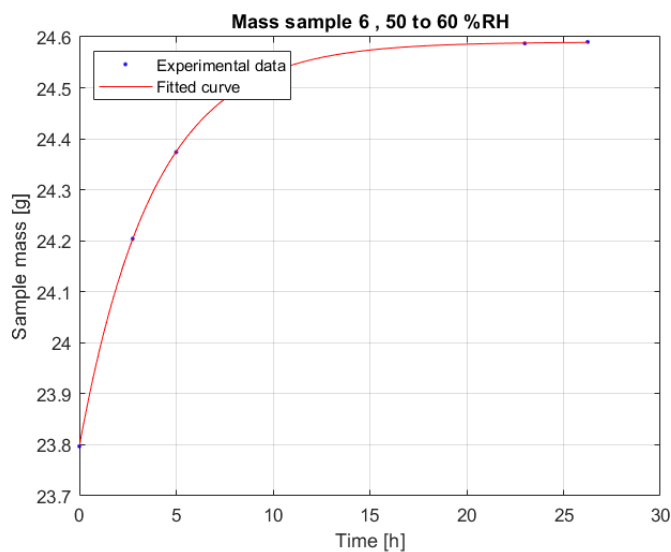
Sample 6:

Figure 2.55: fitted curve

SSE	3.34e-06
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.001
a	0.793
c	23.797
End value	24.590
b	0.261

Table 2.48: Goodness of Fit

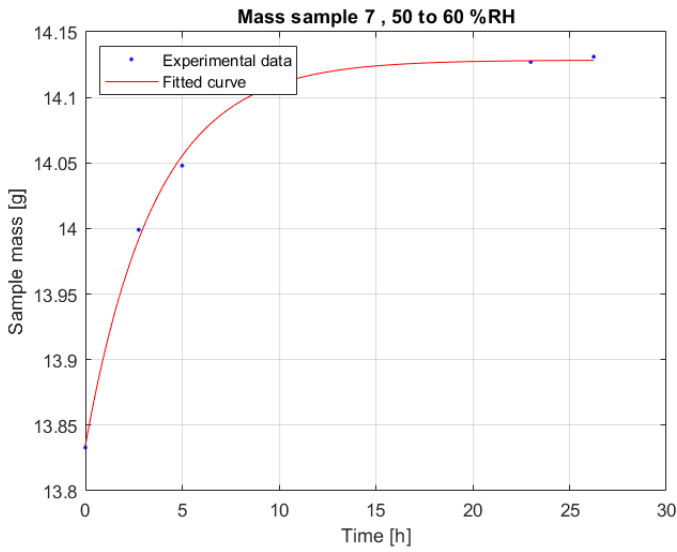
Sample 7:

Figure 2.56: fitted curve

SSE	1.18e-04
R-Square	0.998
DFE	2
Adjusted R-Square	0.996
RMSE	0.008
a	0.294
c	13.835
End value	14.128
b	0.278

Table 2.49: Goodness of Fit

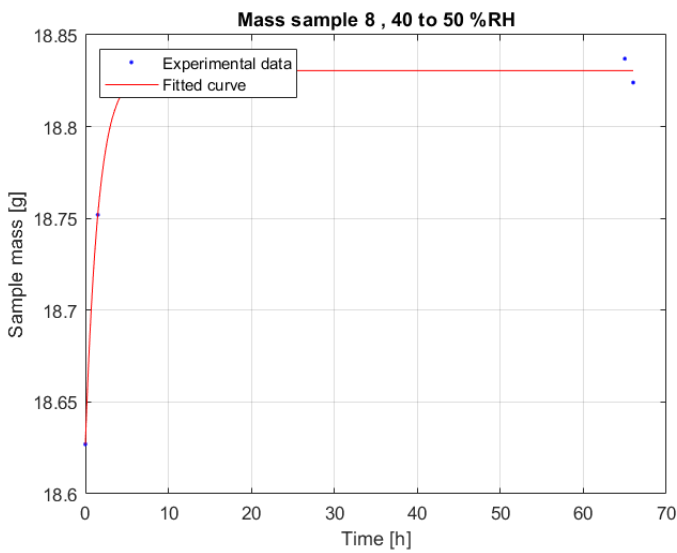
Sample 8:

Figure 2.57: fitted curve

SSE	2.07e-04
R-Square	0.997
DFE	2
Adjusted R-Square	0.994
RMSE	0.010
a	0.317
c	18.825
End value	19.142
b	0.386

Table 2.50: Goodness of Fit

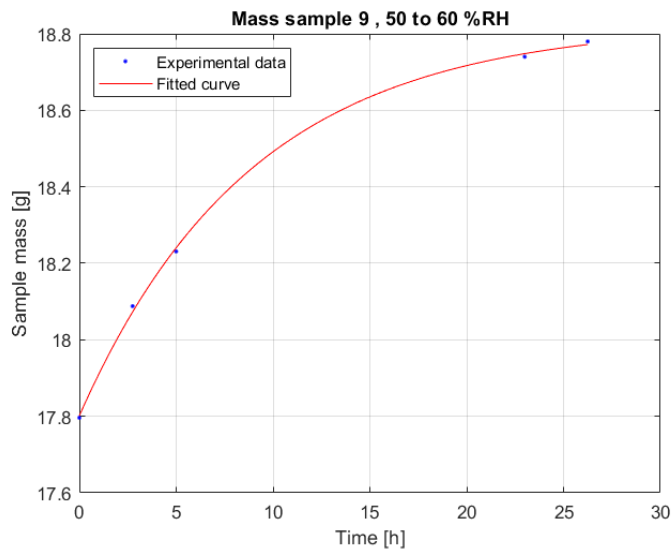
Sample 9:

Figure 2.58: fitted curve

SSE	4.80e-04
R-Square	0.999
DFE	2
Adjusted R-Square	0.999
RMSE	0.015
a	1.025
c	17.801
End value	18.826
b	0.112

Table 2.51: Goodness of Fit

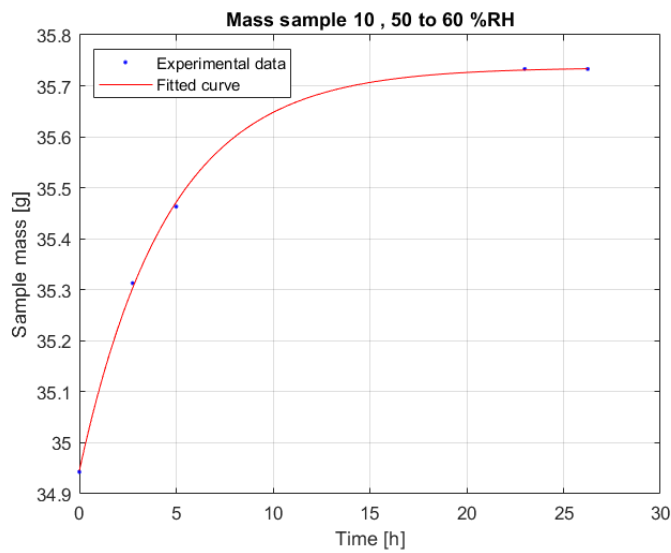
Sample 10:

Figure 2.59: fitted curve

SSE	1.81e-04
R-Square	1.000
DFE	2
Adjusted R-Square	0.999
RMSE	0.010
a	0.791
c	34.945
End value	35.736
b	0.219

Table 2.52: Goodness of Fit

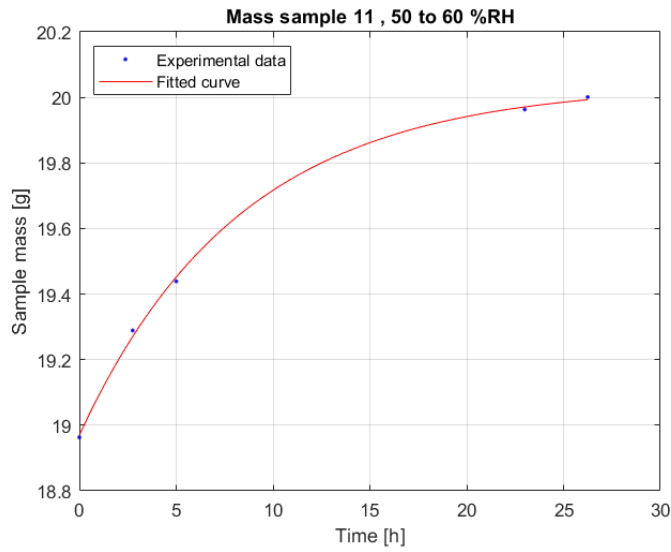
Sample 11:

Figure 2.60: fitted curve

SSE	6.99e-04
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.019
a	1.069
c	18.969
End value	20.039
b	0.120

Table 2.53: Goodness of Fit

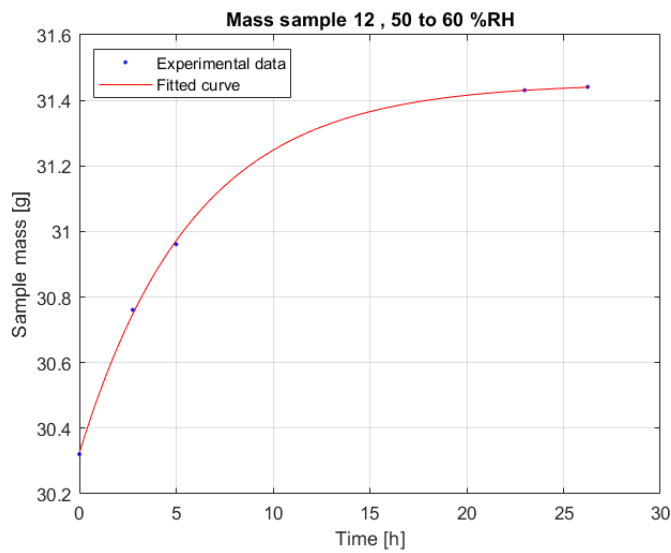
Sample 12:

Figure 2.61: fitted curve

SSE	3.30e-04
R-Square	1.000
DFE	2
Adjusted R-Square	0.999
RMSE	0.013
a	1.128
c	30.325
End value	31.453
b	0.171

Table 2.54: Goodness of Fit

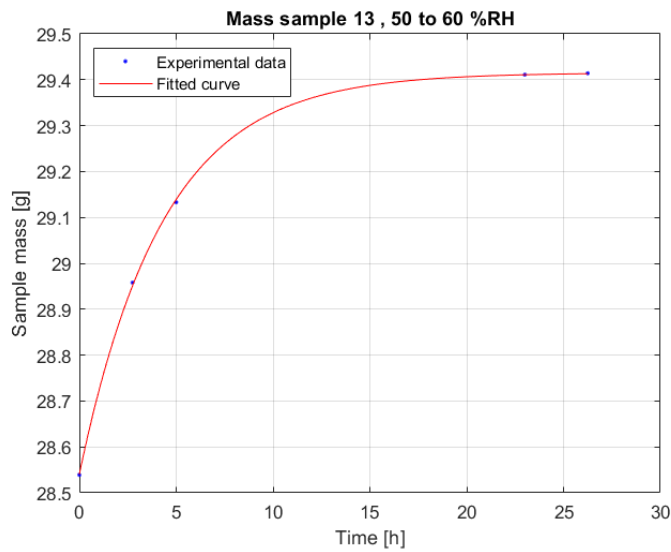
Sample 13:

Figure 2.62: fitted curve

SSE	8.51e-05
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.007
a	0.875
c	28.541
End value	29.415
b	0.231

Table 2.55: Goodness of Fit

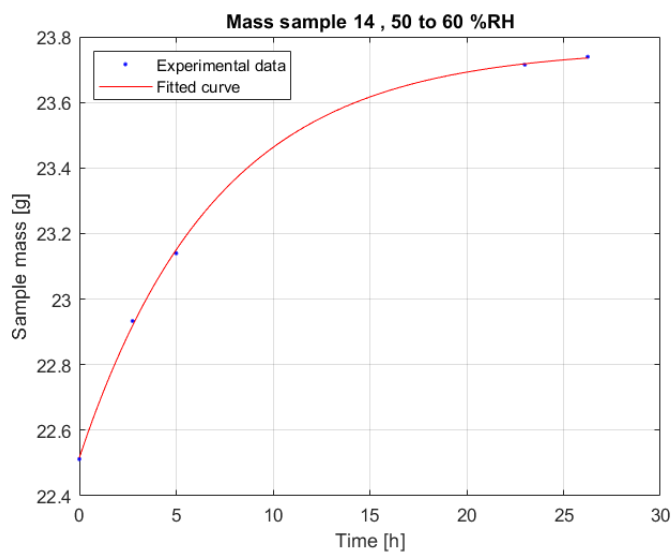
Sample 14:

Figure 2.63: fitted curve

SSE	3.31e-04
R-Square	1.000
DFE	2
Adjusted R-Square	0.999
RMSE	0.013
a	1.250
c	22.516
End value	23.766
b	0.142

Table 2.56: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	4,19E-05	1,000	2	1,000	0,005	25,269	0,691	25,960	0,263
2	3,56E-05	1,000	2	1,000	0,004	25,332	0,758	26,090	0,258
3	2,40E-04	1,000	2	1,000	0,011	33,418	1,455	34,873	0,186
4	1,56E-06	1,000	2	1,000	0,001	22,105	0,723	22,828	0,237
5	7,71E-07	1,000	2	1,000	0,001	23,522	0,758	24,280	0,257
6	3,34E-06	1,000	2	1,000	0,001	23,797	0,793	24,590	0,261
7	1,18E-04	0,998	2	0,996	0,008	13,835	0,294	14,128	0,278
8	2,07E-04	0,997	2	0,994	0,010	18,825	0,317	19,142	0,386
9	4,80E-04	0,999	2	0,999	0,015	17,801	1,025	18,826	0,112
10	1,81E-04	1,000	2	0,999	0,010	34,945	0,791	35,736	0,219
11	6,99E-04	0,999	2	0,998	0,019	18,969	1,069	20,039	0,120
12	3,30E-04	1,000	2	0,999	0,013	30,325	1,128	31,453	0,171
13	8,51E-05	1,000	2	1,000	0,007	28,541	0,875	29,415	0,231
14	3,31E-04	1,000	2	0,999	0,013	22,516	1,250	23,766	0,142

Figure 2.64: Goodness of Fit and final values for step 50 to 60 %RH.

2.5 Step: 60 to 70 %RH

The obtained data for a step from 60 to 70 %RH:

Raw data

		Tue 7/12 12:30	Tue 7/12 15:30	Tue 7/12 17:15	Wed 8/12 10:00	Wed 8/12 12:45	Wed 8/12 15:00	
RH setpoint [%RH]		60	70	70	70	70	70	
RH measured [%RH]		60,4	70,2	70,4	70,1	70,5	70,4	
T measured [C]		21,7	21,7	21,7	21,7	21,7	21,7	
Time [h]		0,00	2,75	5,50	21,50	24,25	26,50	
Sample no.								
								FINAL DM/DT [g/h]
	1	25,959	26,239	26,276	26,319	26,321	26,318	-0,001
			+0,280	+0,037	+0,043	+0,002	-0,003	-0,000
	2	26,089	26,399	26,454	26,528	26,530	26,529	-0,000
			+0,310	+0,055	+0,074	+0,002	-0,001	-0,000
	3	34,863	35,39	35,52	35,74	35,74	35,73	-0,00
			+0,53	+0,13	+0,22	+0,00	-0,01	-0,00
	4	22,827	23,096	23,129	23,169	23,177	23,173	-0,002
			+0,269	+0,033	+0,040	+0,008	-0,004	-0,002
	5	24,279	24,570	24,602	24,637	24,646	24,640	-0,003
			+0,291	+0,032	+0,035	+0,009	-0,006	-0,003
	6	24,590	24,890	24,923	24,959	24,967	24,962	-0,002
			+0,300	+0,033	+0,036	+0,008	-0,005	-0,002
	7	14,131	14,351	14,410	14,630	14,642	14,638	-0,002
			+0,220	+0,059	+0,220	+0,012	-0,004	-0,002
	8	19,145	19,457	19,531	19,748	19,753	19,756	+0,001
			+0,312	+0,074	+0,217	+0,005	+0,003	+0,001
	9	18,780	19,232	19,408	20,442	20,524	20,584	+0,027
			+0,452	+0,176	+1,034	+0,082	+0,060	+0,027
	10	35,73	36,01	36,06	36,13	36,13	36,13	+0,00
			+0,28	+0,05	+0,07	+0,00	+0,00	+0,00
	11	20,001	20,492	20,691	21,814	21,897	21,973	+0,034
			+0,491	+0,199	+1,123	+0,083	+0,076	+0,034
	12	31,44	31,83	31,92	32,04	32,04	32,04	+0,00
			+0,39	+0,09	+0,12	+0,00	+0,00	+0,00
	13	29,414	29,707	29,746	29,771	29,772	29,777	+0,002
			+0,293	+0,039	+0,025	+0,001	+0,005	+0,002
	14	23,739	24,239	24,416	24,880	24,883	24,887	+0,002
			+0,500	+0,177	+0,464	+0,003	+0,004	+0,002
	Empty	-0,020	-0,020	-0,018	-0,021	-0,021	-0,020	+0,000
			+0,000	+0,002	-0,003	+0,000	+0,001	+0,000

Figure 2.65: Mass of samples for a step from 60 to 70 %RH.

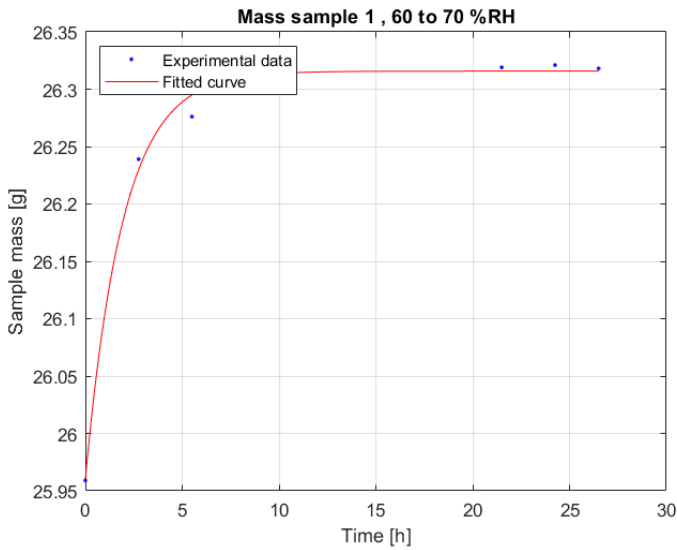
Sample 1:

Figure 2.66: fitted curve

SSE	4.89e-04
R-Square	0.995
DFE	3
Adjusted R-Square	0.992
RMSE	0.013
a	0.356
c	25.960
End value	26.316
b	0.516

Table 2.57: Goodness of Fit

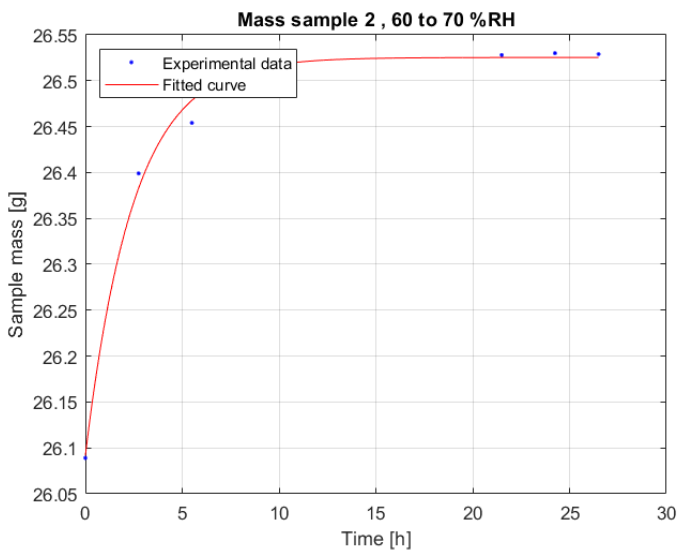
Sample 2:

Figure 2.67: fitted curve

SSE	9.12e-04
R-Square	0.994
DFE	3
Adjusted R-Square	0.990
RMSE	0.017
a	0.434
c	26.092
End value	26.525
b	0.405

Table 2.58: Goodness of Fit

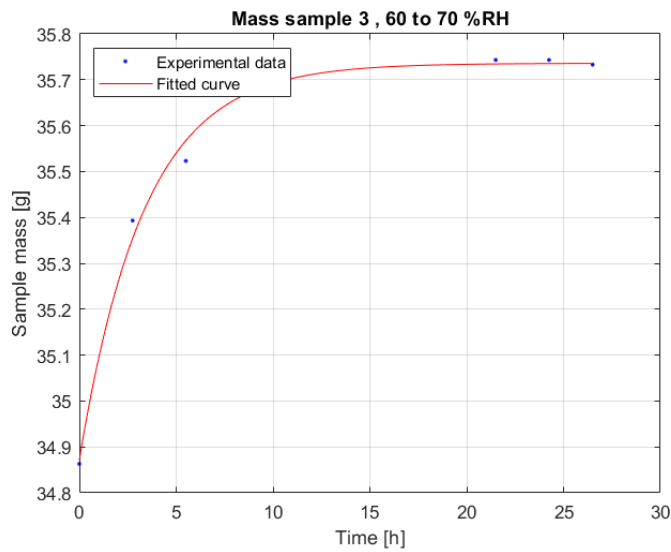
Sample 3:

Figure 2.68: fitted curve

SSE	3.68e-03
R-Square	0.994
DFE	3
Adjusted R-Square	0.990
RMSE	0.035
a	0.864
c	34.872
End value	35.736
b	0.297

Table 2.59: Goodness of Fit

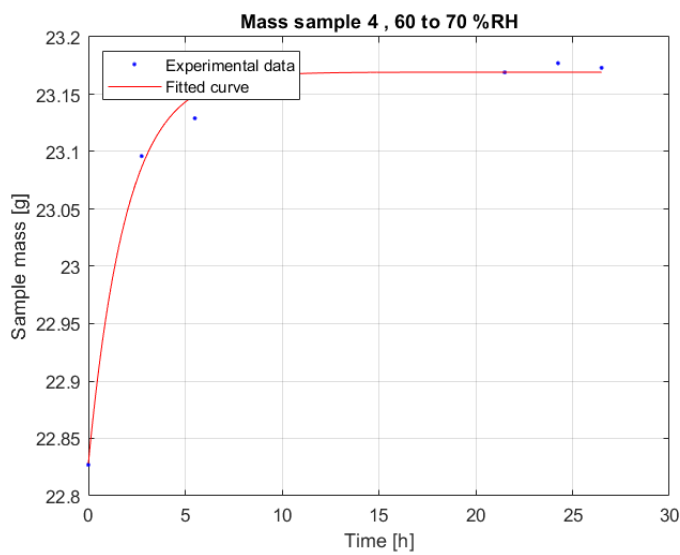
Sample 4:

Figure 2.69: fitted curve

SSE	5.73e-04
R-Square	0.994
DFE	3
Adjusted R-Square	0.990
RMSE	0.014
a	0.341
c	22.828
End value	23.169
b	0.514

Table 2.60: Goodness of Fit

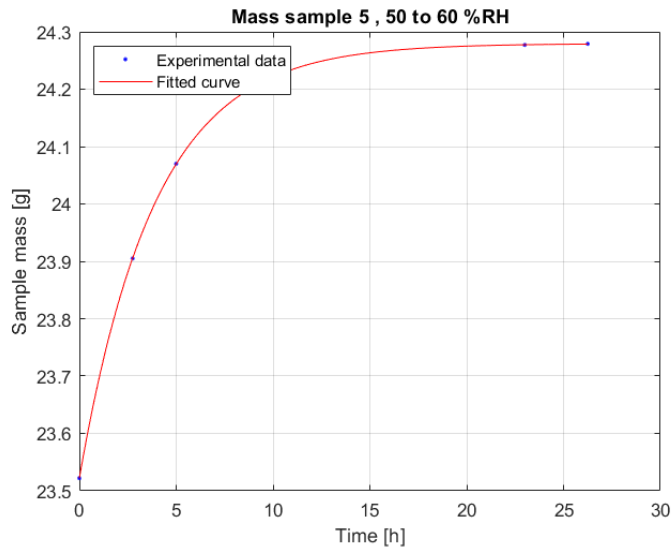
Sample 5:

Figure 2.70: fitted curve

SSE	5.25e-04
R-Square	0.995
DFE	3
Adjusted R-Square	0.991
RMSE	0.013
a	0.357
c	24.280
End value	24.637
b	0.567

Table 2.61: Goodness of Fit

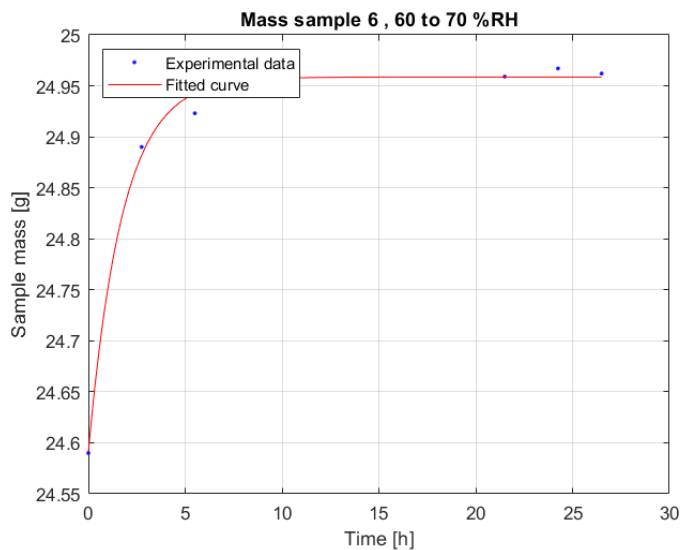
Sample 6:

Figure 2.71: fitted curve

SSE	5.33e-04
R-Square	0.995
DFE	3
Adjusted R-Square	0.992
RMSE	0.013
a	0.368
c	24.591
End value	24.959 heightb
0.569	

Table 2.62: Goodness of Fit

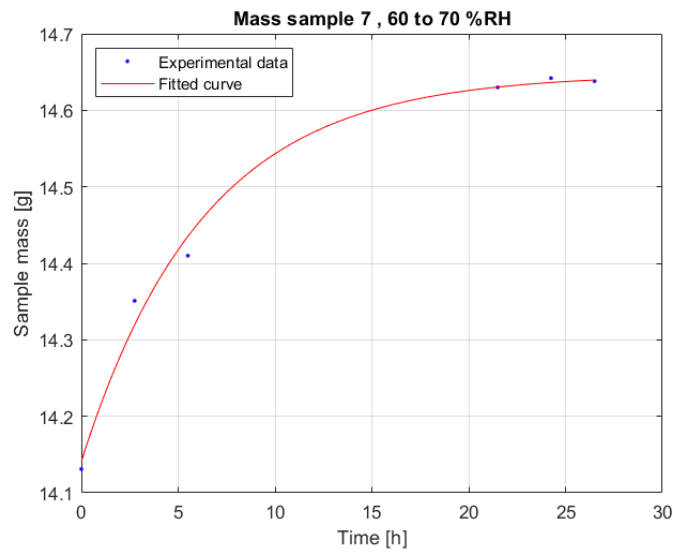
Sample 7:

Figure 2.72: fitted curve

SSE	1.76e-03
R-Square	0.992
DFE	3
Adjusted R-Square	0.986
RMSE	0.024
a	0.506
c	14.141
End value	14.647
b	0.158

Table 2.63: Goodness of Fit

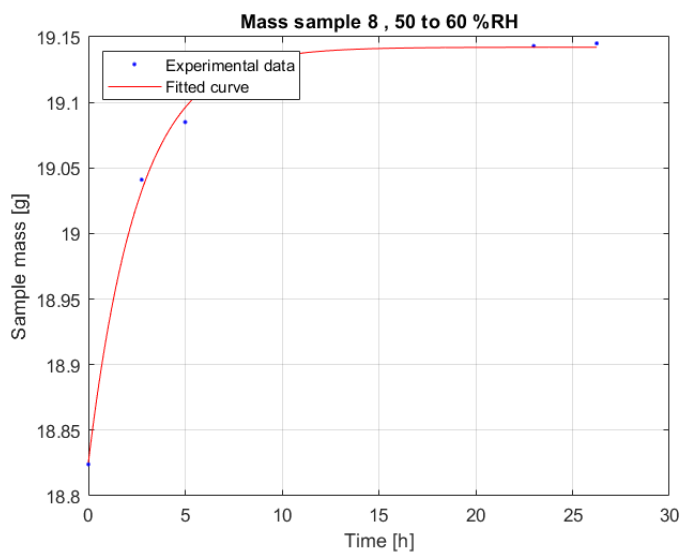
Sample 8:

Figure 2.73: fitted curve

SSE	2.84e-03
R-Square	0.990
DFE	3
Adjusted R-Square	0.984
RMSE	0.031
a	0.598
c	19.156
End value	19.754
b	0.210

Table 2.64: Goodness of Fit

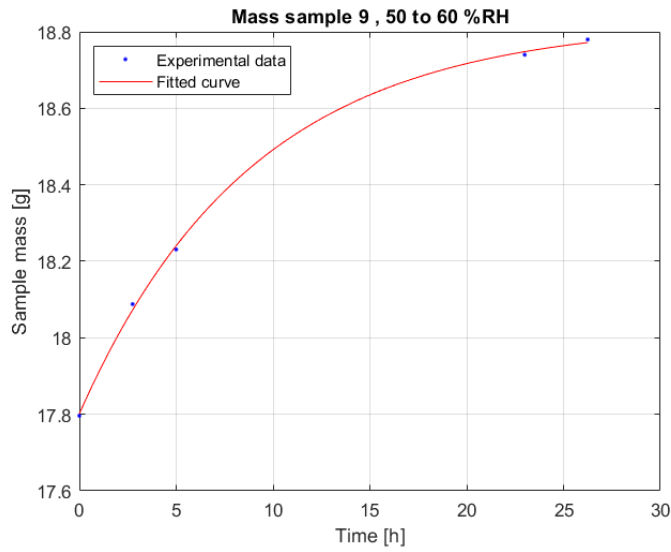
Sample 9:

Figure 2.74: fitted curve

SSE	8.22e-03
R-Square	0.997
DFE	3
Adjusted R-Square	0.996
RMSE	0.052
a	2.169
c	18.807
End value	20.976
b	0.065

Table 2.65: Goodness of Fit

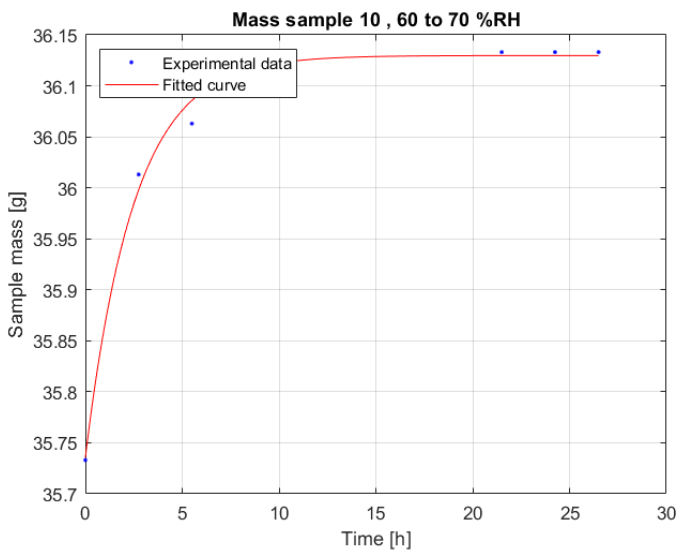
Sample 10:

Figure 2.75: fitted curve

SSE	7.80e-04
R-Square	0.994
DFE	3
Adjusted R-Square	0.989
RMSE	0.016
a	0.394
c	35.736
End value	36.130
b	0.398

Table 2.66: Goodness of Fit

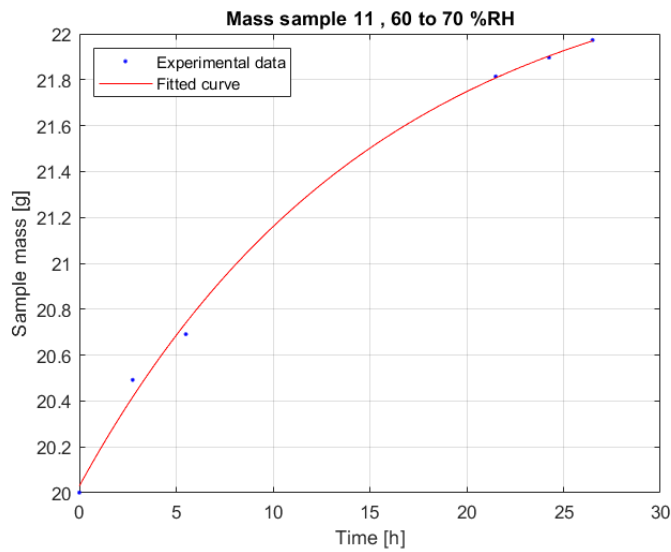
Sample 11:

Figure 2.76: fitted curve

SSE	9.01e-03
R-Square	0.998
DFE	3
Adjusted R-Square	0.996
RMSE	0.055
a	2.359
c	20.030
End value	22.388
b	0.065

Table 2.67: Goodness of Fit

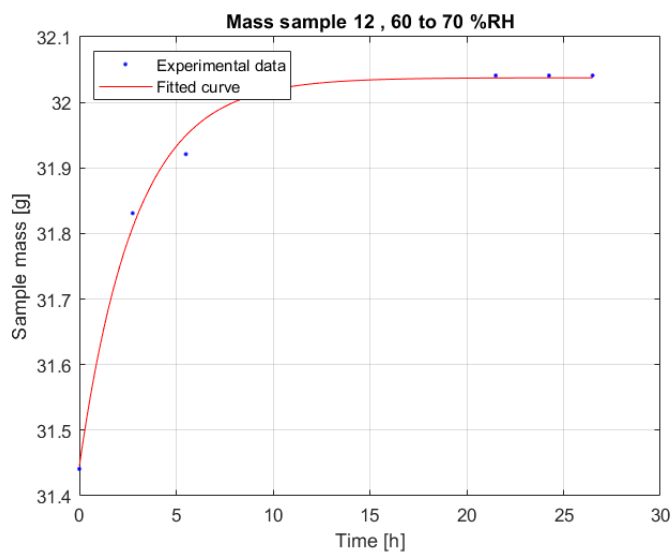
Sample 12:

Figure 2.77: fitted curve

SSE	1.35e-03
R-Square	0.995
DFE	3
Adjusted R-Square	0.992
RMSE	0.021
a	0.592
c	31.445
End value	32.038
b	0.346

Table 2.68: Goodness of Fit

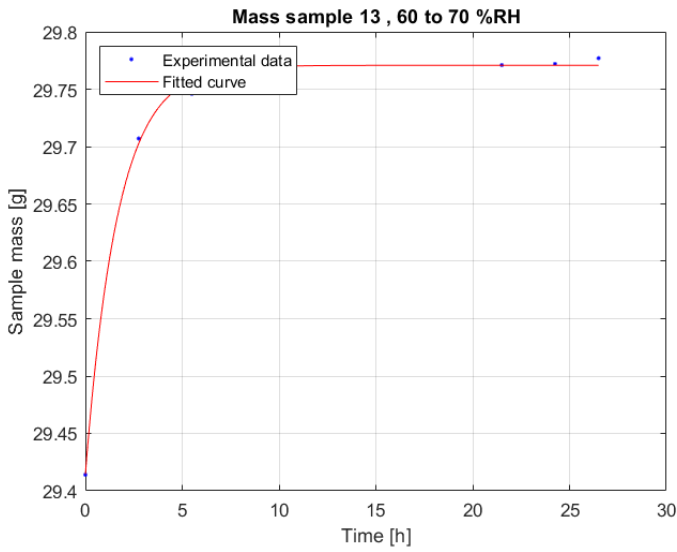
Sample 13:

Figure 2.78: fitted curve

SSE	1.97e-04
R-Square	0.998
DFE	3
Adjusted R-Square	0.997
RMSE	0.008
a	0.356
c	29.414
End value	29.771
b	0.601

Table 2.69: Goodness of Fit

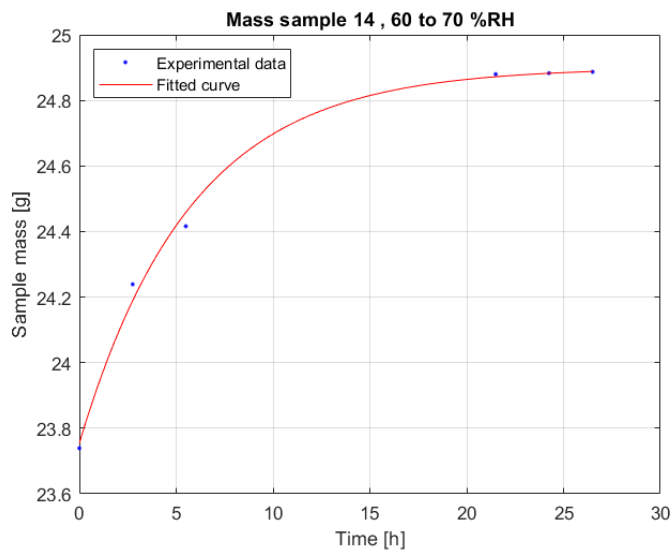
Sample 14:

Figure 2.79: fitted curve

SSE	4.62e-03
R-Square	0.996
DFE	3
Adjusted R-Square	0.993
RMSE	0.039
a	1.146
c	23.754
End value	24.900
b	0.173

Table 2.70: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	4,89E-04	0,995	3	0,992	0,013	25,960	0,356	26,316	0,516
2	9,12E-04	0,994	3	0,990	0,017	26,092	0,434	26,525	0,405
3	3,68E-03	0,994	3	0,990	0,035	34,872	0,864	35,736	0,297
4	5,73E-04	0,994	3	0,990	0,014	22,828	0,341	23,169	0,514
5	5,25E-04	0,995	3	0,991	0,013	24,280	0,357	24,637	0,567
6	5,33E-04	0,995	3	0,992	0,013	24,591	0,368	24,959	0,569
7	1,76E-03	0,992	3	0,986	0,024	14,141	0,506	14,647	0,158
8	2,84E-03	0,990	3	0,984	0,031	19,156	0,598	19,754	0,210
9	8,22E-03	0,997	3	0,996	0,052	18,807	2,169	20,976	0,065
10	7,80E-04	0,994	3	0,989	0,016	35,736	0,394	36,130	0,398
11	9,01E-03	0,998	3	0,996	0,055	20,030	2,359	22,388	0,065
12	1,35E-03	0,995	3	0,992	0,021	31,445	0,592	32,038	0,346
13	1,97E-04	0,998	3	0,997	0,008	29,414	0,356	29,771	0,601
14	4,62E-03	0,996	3	0,993	0,039	23,754	1,146	24,900	0,173

Figure 2.80: Goodness of Fit and final values for step 60 to 70 %RH.

2.6 Step: 70 to 80 %RH

The obtained data for a step from 70 to 80 %RH:

Raw data

	Wed 8/12 15:30	Wed 8/12 17:30	Thu 9/12 09:00	Thu 9/12 13:00	Thu 9/12 16:30	
RH setpoint [%RH]	70	80	80	80	80	
RH measured [%RH]	70,4	78,8-81,4	78,8-81,8	78,8-81,4	78,6-81,2	
T measured [C]	21,7	21,7	21,7	21,7	21,7	
Time [h]	0,00	2,00	17,50	21,50	25,00	
Sample no.						
						FINAL DM/DT [g/h]
1	26,318	26,467	26,529	26,526	26,530	
		+0,149	+0,062	-0,003	+0,004	+0,001
2	26,529	26,729	26,854	26,851	26,858	
		+0,200	+0,125	-0,003	+0,007	+0,002
3	35,73	35,98	36,09	36,09	36,10	
		+0,25	+0,11	+0,00	0,01	+0,00
4	23,173	23,309	23,360	23,363	23,366	
		+0,136	+0,051	+0,003	+0,003	+0,001
5	24,640	24,782	24,833	24,835	24,837	
		+0,142	+0,051	+0,002	+0,002	+0,001
6	24,962	25,104	25,151	25,155	25,157	
		+0,142	+0,047	+0,004	+0,002	+0,001
7	14,638	14,892	15,643	15,715	15,775	
		+0,254	+0,751	+0,072	+0,060	+0,017
8	19,756	20,082	21,090	21,203	21,289	
		+0,326	+1,008	+0,113	+0,086	+0,025
9	20,584	21,041	23,196	23,479	23,707	
		+0,457	+2,155	+0,283	+0,228	+0,065
10	36,13	36,29	36,39	36,40	36,40	
		+0,16	+0,10	+0,01	+0,00	+0,00
11	21,973	22,480	24,903	25,246	25,527	
		+0,507	+2,423	+0,343	+0,281	+0,080
12	32,04	32,22	32,32	32,32	32,33	
		+0,18	+0,10	+0,00	+0,01	+0,00
13	29,777	29,924	29,965	29,969	29,975	
		+0,147	+0,041	+0,004	+0,006	+0,002
14	24,887	25,141	25,209	25,208	25,213	
		+0,254	+0,068	-0,001	+0,005	+0,001
Empty	-0,020	-0,021	-0,021	-0,019	-0,021	
		-0,001	+0,000	+0,002	-0,002	-0,001

Figure 2.81: Mass of samples for a step from 70 to 80 %RH.

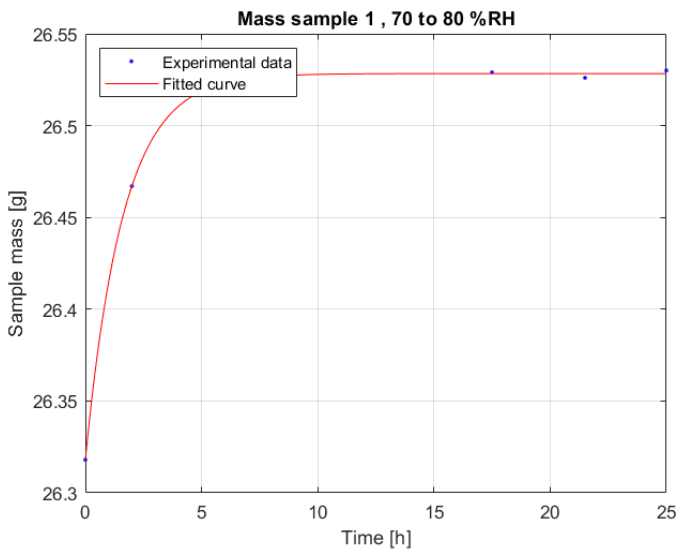
Sample 1:

Figure 2.82: fitted curve

SSE	8.67e-06
R-Square	1.000
DFE	2
Adjusted R-Square	0.999
RMSE	0.002
a	0.210
c	26.318
End value	26.528
b	0.616

Table 2.71: Goodness of Fit

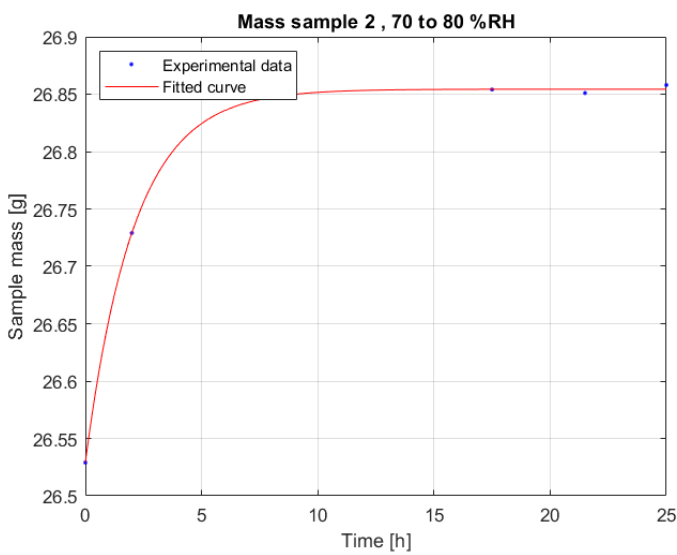
Sample 2:

Figure 2.83: fitted curve

SSE	2.46e-05
R-Square	1.000
DFE	2
Adjusted R-Square	0.999
RMSE	0.004
a	0.325
c	26.529
End value	26.854
b	0.477

Table 2.72: Goodness of Fit

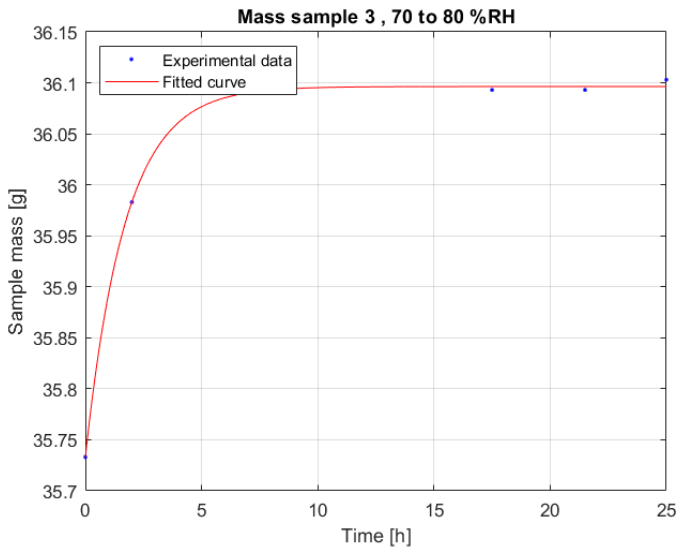
Sample 3:

Figure 2.84: fitted curve

SSE	6.66e-05
R-Square	0.999
DFE	2
Adjusted R-Square	0.999
RMSE	0.006
a	0.363
c	35.733
End value	36.096
b	0.582

Table 2.73: Goodness of Fit

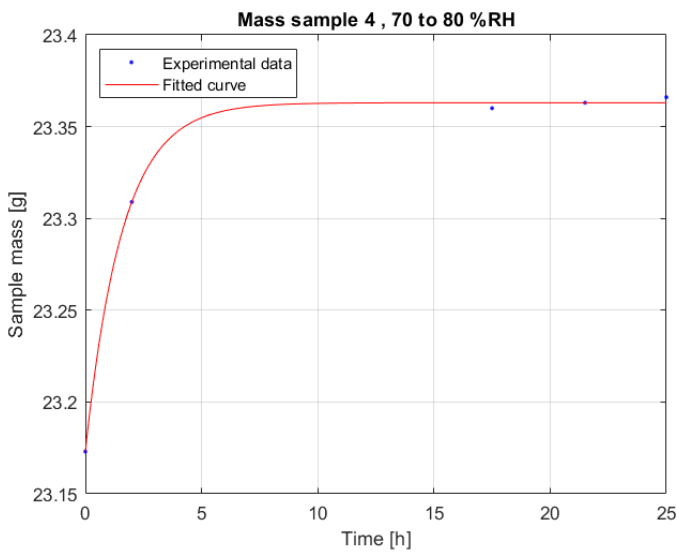
Sample 4:

Figure 2.85: fitted curve

SSE	1.80e-05
R-Square	0.999
DFE	2
Adjusted R-Square	0.999
RMSE	0.003
a	0.190
c	23.173
End value	23.363
b	0.629

Table 2.74: Goodness of Fit

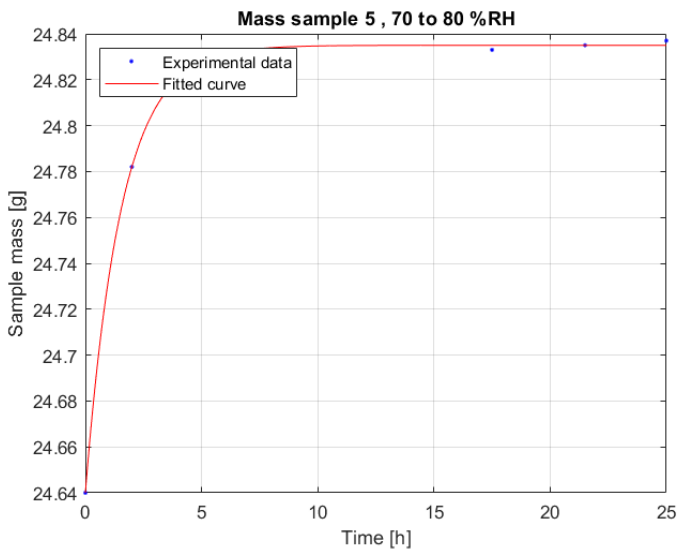
Sample 5:

Figure 2.86: fitted curve

SSE	7.99e-06
R-Square	1.000
DFE	2
Adjusted R-Square	0.999
RMSE	0.002
a	0.195
c	24.640
End value	24.835
b	0.651

Table 2.75: Goodness of Fit

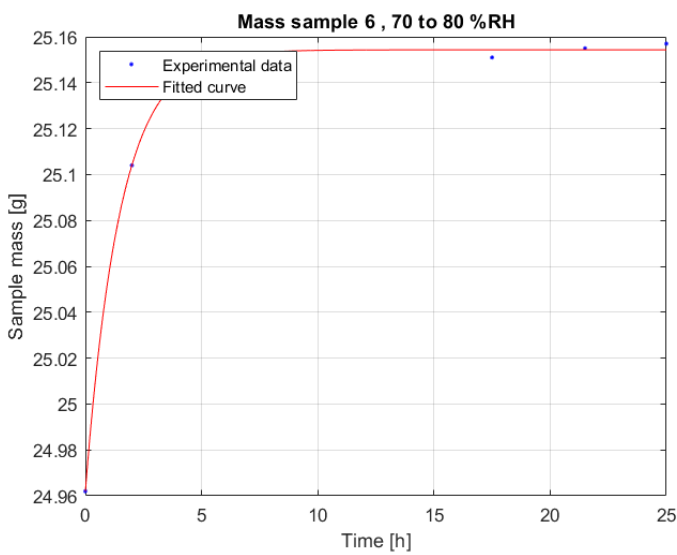
Sample 6:

Figure 2.87: fitted curve

SSE	1.87e-05
R-Square	0.999
DFE	2
Adjusted R-Square	0.999
RMSE	0.003
a	0.192
c	24.962
End value	25.154
b	0.670

Table 2.76: Goodness of Fit

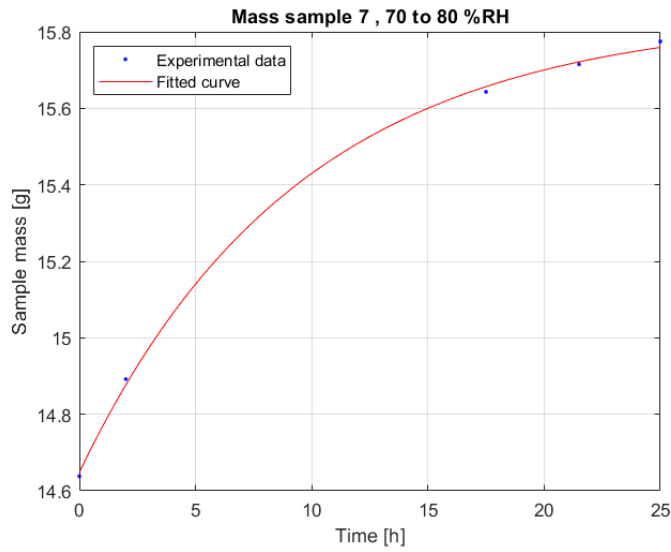
Sample 7:

Figure 2.88: fitted curve

SSE	8.16e-04
R-Square	0.999
DFE	2
Adjusted R-Square	0.999
RMSE	0.020
a	1.195
c	14.648
End value	15.844
b	0.106

Table 2.77: Goodness of Fit

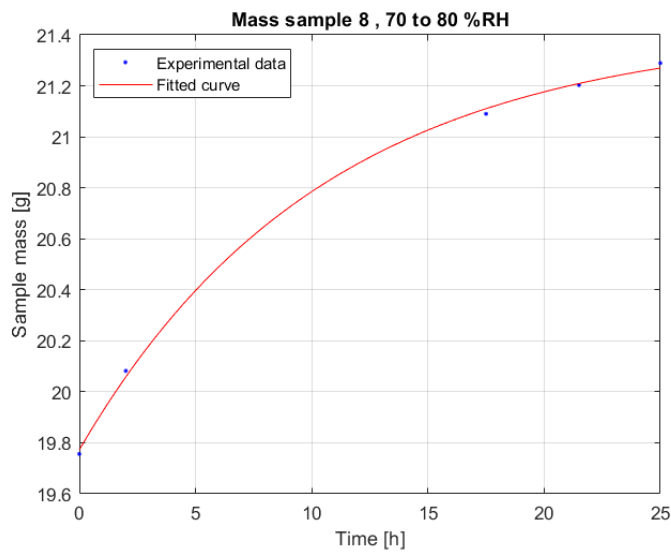
Sample 8:

Figure 2.89: fitted curve

SSE	1.66e-03
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.029
a	1.650
c	19.773
End value	21.423
b	0.095

Table 2.78: Goodness of Fit

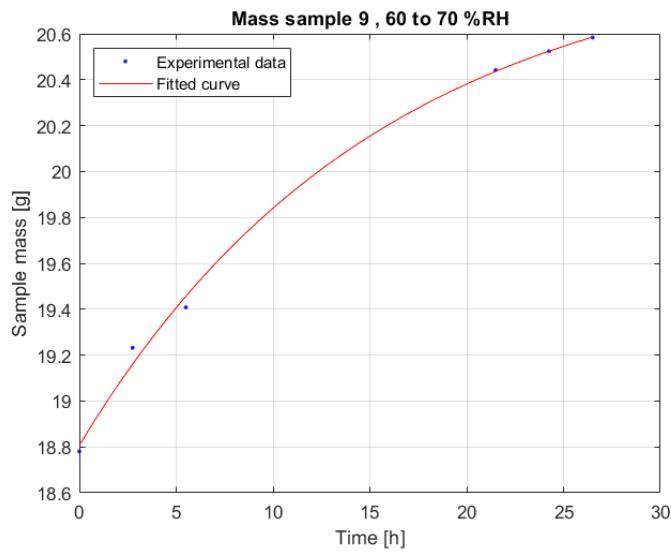
Sample 9:

Figure 2.90: fitted curve

SSE	2.18e-04
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.010
a	4.009
c	20.586
End value	24.595
b	0.060

Table 2.79: Goodness of Fit

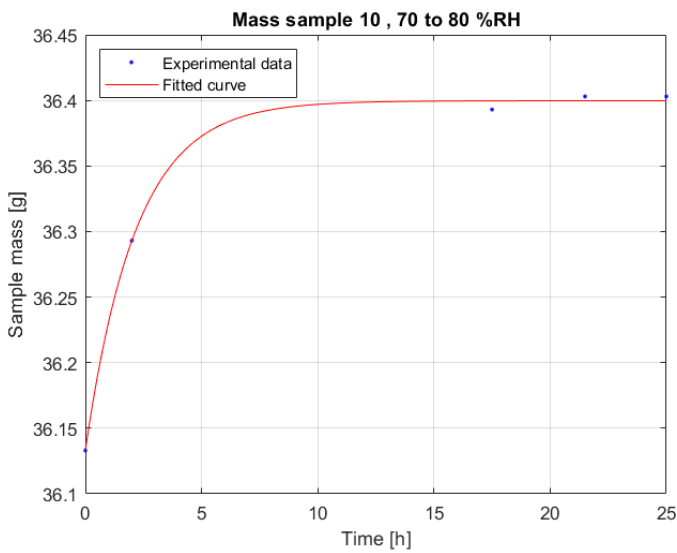
Sample 10:

Figure 2.91: fitted curve

SSE	6.56e-05
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.006
a	0.267
c	36.133
End value	36.400
b	0.458

Table 2.80: Goodness of Fit

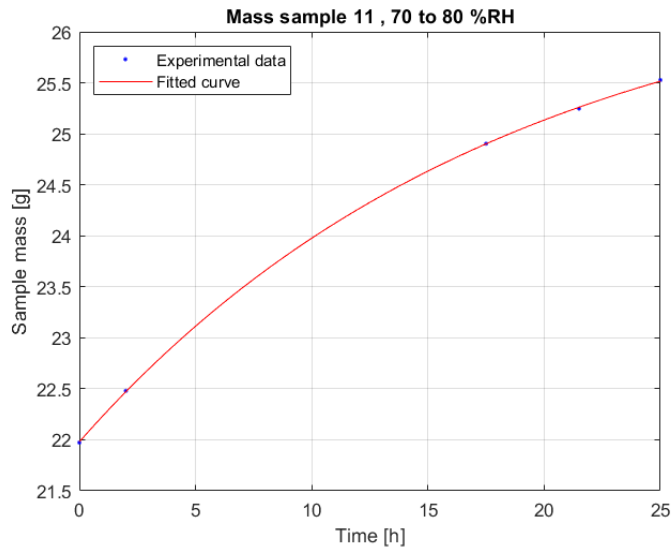
Sample 11:

Figure 2.92: fitted curve

SSE	4.60e-04
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.015
a	4.754
c	21.980
End value	26.734
b	0.054

Table 2.81: Goodness of Fit

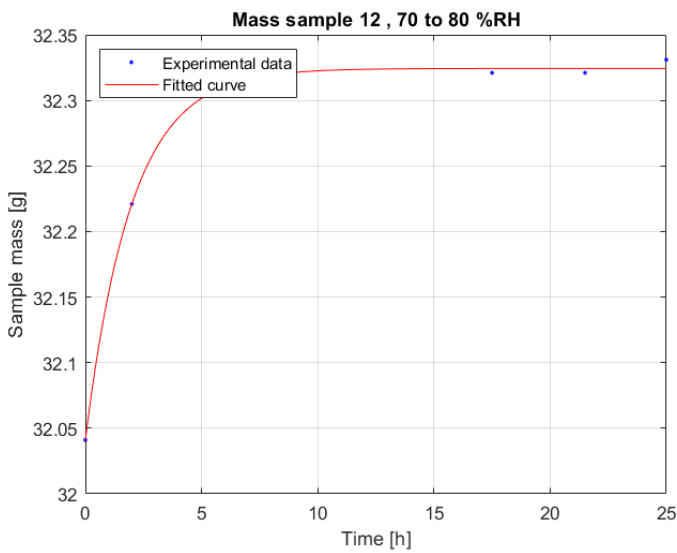
Sample 12:

Figure 2.93: fitted curve

SSE	6.64e-05
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.006
a	0.283
c	32.041
End value	32.324
b	0.504

Table 2.82: Goodness of Fit

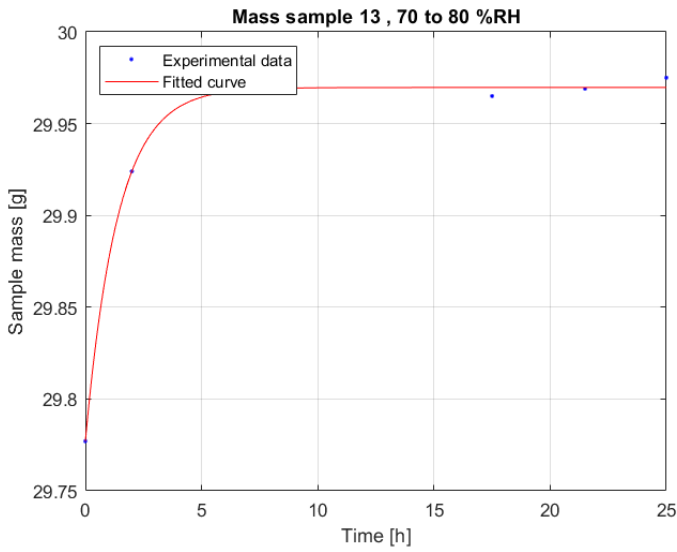
Sample 13:

Figure 2.94: fitted curve

SSE	5.07e-05
R-Square	0.998
DFE	2
Adjusted R-Square	0.996
RMSE	0.005
a	0.193
c	29.777
End value	29.970
b	0.720

Table 2.83: Goodness of Fit

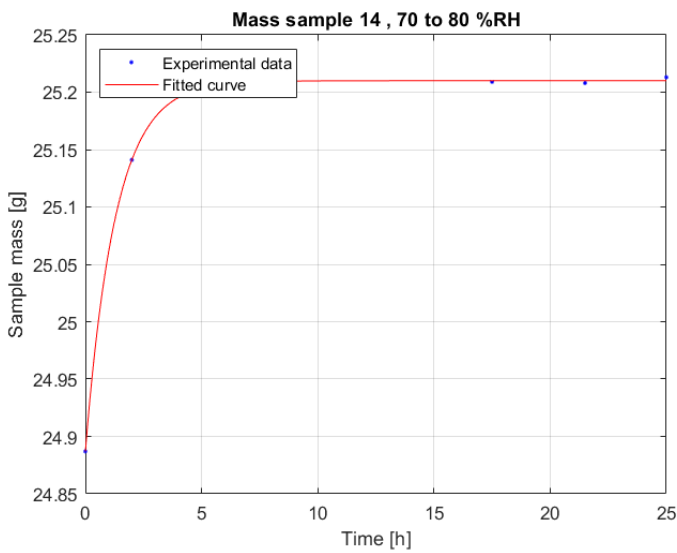
Sample 14:

Figure 2.95: fitted curve

SSE	1.40e-05
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.003
a	0.323
c	24.887
End value	25.210
b	0.772

Table 2.84: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	8,67E-06	1,000	2	0,999	0,002	26,318	0,210	26,528	0,616
2	2,46E-05	1,000	2	0,999	0,004	26,529	0,325	26,854	0,477
3	6,66E-05	0,999	2	0,999	0,006	35,733	0,363	36,096	0,582
4	1,80E-05	0,999	2	0,999	0,003	23,173	0,190	23,363	0,629
5	7,99E-06	1,000	2	0,999	0,002	24,640	0,195	24,835	0,651
6	1,87E-05	0,999	2	0,999	0,003	24,962	0,192	25,154	0,670
7	8,16E-04	0,999	2	0,999	0,020	14,648	1,195	15,844	0,106
8	1,66E-03	0,999	2	0,998	0,029	19,773	1,650	21,423	0,095
9	2,18E-04	1,000	2	1,000	0,010	20,586	4,009	24,595	0,060
10	6,56E-05	0,999	2	0,998	0,006	36,133	0,267	36,400	0,458
11	4,60E-04	1,000	2	1,000	0,015	21,980	4,754	26,734	0,054
12	6,64E-05	0,999	2	0,998	0,006	32,041	0,283	32,324	0,504
13	5,07E-05	0,998	2	0,996	0,005	29,777	0,193	29,970	0,720
14	1,40E-05	1,000	2	1,000	0,003	24,887	0,323	25,210	0,772

Figure 2.96: Goodness of Fit and final values for step 70 to 80 %RH.

2.7 Step: 80 to 70 %RH

The obtained data for a step from 80 to 70 %RH:

Raw data

	Fri 14/1 09:45	Fri 14/1 12:00	Fri 14/1 15:00	Fri 14/1 17:15	Mon 17/1 09:00	
RH setpoint [%RH]	80	70	70	70	70	
RH measured [%RH]	80,1	70,0	70,0	70,1	70,0	
T measured [C]	21,8	21,7	21,7	21,7	21,7	
Time [h]	0,00	2,25	5,25	7,50	71,25	
Sample no.						FINAL DM/DT [g/h]
1	26,202	26,070	26,053	26,053	26,051	-0,000
2	+0,020	-0,132	-0,017	+0,000	-0,002	-0,000
3	26,430	26,275	26,247	26,242	26,230	-0,000
4	+0,039	-0,155	-0,028	-0,005	-0,012	-0,000
5	35,513	35,313	35,283	35,283	35,273	-0,000
6	+0,040	-0,200	-0,030	+0,000	-0,010	-0,000
7	23,060	22,943	22,929	22,929	22,915	-0,000
8	+0,013	-0,117	-0,014	+0,000	-0,014	-0,000
9	24,529	24,404	24,392	24,393	24,382	-0,000
10	+0,010	-0,125	-0,012	+0,001	-0,011	-0,000
11	24,829	24,697	24,687	24,689	24,678	-0,000
12	+0,015	-0,132	-0,010	+0,002	-0,011	-0,000
13	15,905	15,538	15,264	15,135	14,751	-0,006
14	+0,240	-0,367	-0,274	-0,129	-0,384	-0,006
15	21,559	21,095	20,797	20,651	20,111	-0,008
16	+0,326	-0,464	-0,298	-0,146	-0,540	-0,008
17	24,457	24,036	23,758	23,635	23,196	-0,007
18	+0,530	-0,421	-0,278	-0,123	-0,439	-0,007
19	35,983	35,823	35,793	35,793	35,783	-0,000
20	+0,050	-0,160	-0,030	+0,000	-0,010	-0,000
21	26,368	25,896	25,596	25,457	24,917	-0,008
22	+0,673	-0,472	-0,300	-0,139	-0,540	-0,008
23	31,941	31,771	31,741	31,741	31,731	-0,000
24	+0,040	-0,170	-0,030	+0,000	-0,010	-0,000
25	29,893	29,745	29,733	29,731	29,729	-0,000
26	+0,036	-0,148	-0,012	-0,002	-0,002	-0,000
27	25,208	25,075	25,067	25,069	25,068	-0,000
28	+0,013	-0,133	-0,008	+0,002	-0,001	-0,000
Empty	-0,018	-0,017	-0,019	-0,018	-0,018	-0,000
	+0,003	+0,001	-0,002	+0,001	+0,000	+0,000

Figure 2.97: Mass of samples for a step from 80 to 70 %RH.

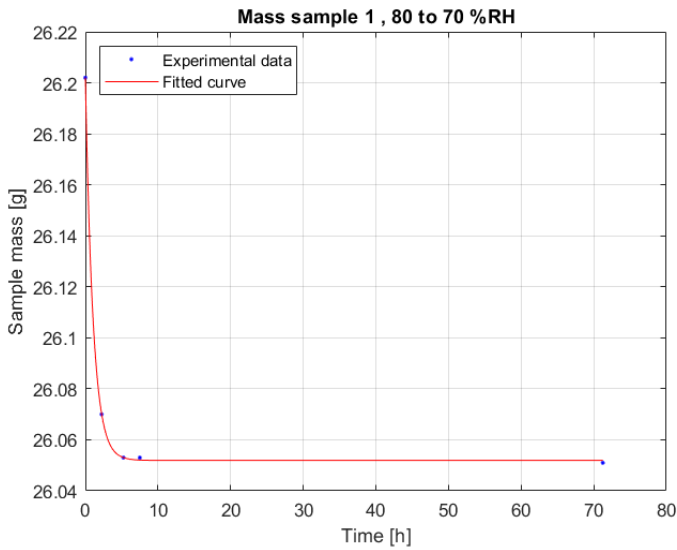
Sample 1:

Figure 2.98: fitted curve

SSE	1.75e-06
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.001
a	-0.150
c	26.202
End value	26.052
b	0.940

Table 2.85: Goodness of Fit

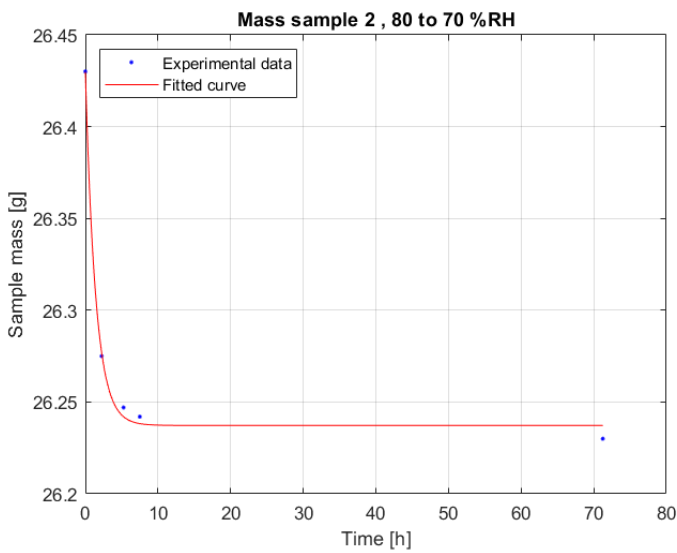
Sample 2:

Figure 2.99: fitted curve

SSE	9.46e-05
R-Square	0.997
DFE	2
Adjusted R-Square	0.993
RMSE	0.007
a	-0.193
c	26.430
End value	26.237
b	0.704

Table 2.86: Goodness of Fit

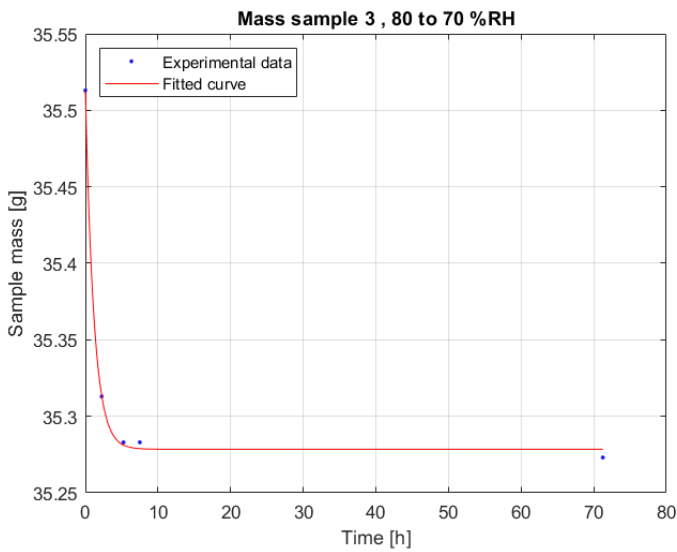
Sample 3:

Figure 2.100: fitted curve

SSE	5.02e-05
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.005
a	-0.235
c	35.513
End value	35.278
b	0.845

Table 2.87: Goodness of Fit

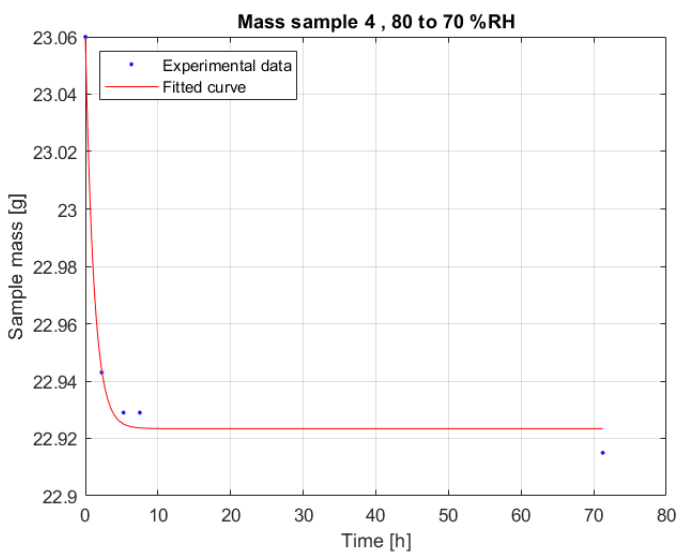
Sample 4:

Figure 2.101: fitted curve

SSE	1.16e-04
R-Square	0.992
DFE	2
Adjusted R-Square	0.984
RMSE	0.008
a	-0.137
c	23.060
End value	22.923
b	0.842

Table 2.88: Goodness of Fit

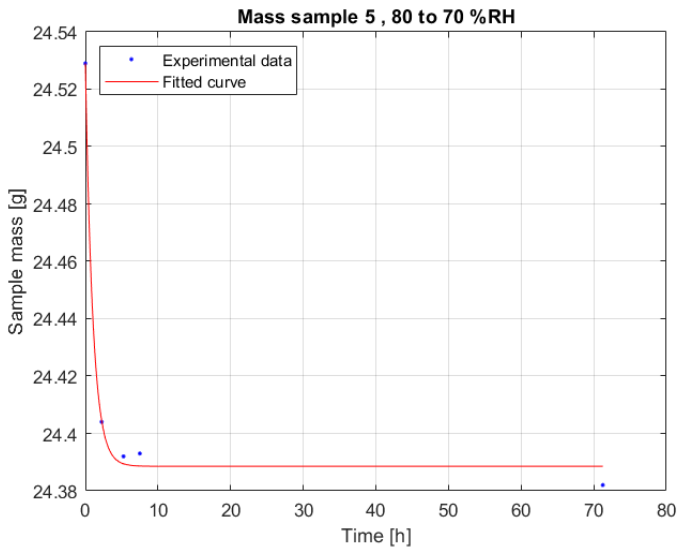
Sample 5:

Figure 2.102: fitted curve

SSE	6.87e-05
R-Square	0.995
DFE	2
Adjusted R-Square	0.991
RMSE	0.006
a	-0.140
c	24.529
End value	24.389
b	0.969

Table 2.89: Goodness of Fit

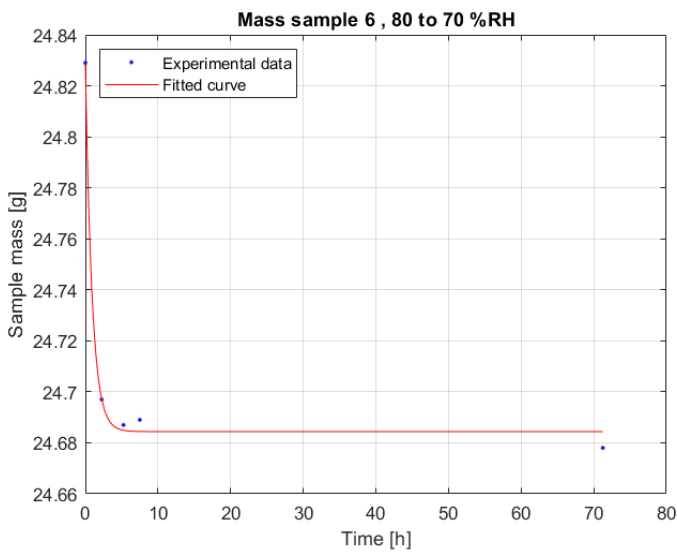
Sample 6:

Figure 2.103: fitted curve

SSE	6.61e-05
R-Square	0.996
DFE	2
Adjusted R-Square	0.992
RMSE	0.006
a	-0.145
c	24.829
End value	24.684
b	1.075

Table 2.90: Goodness of Fit

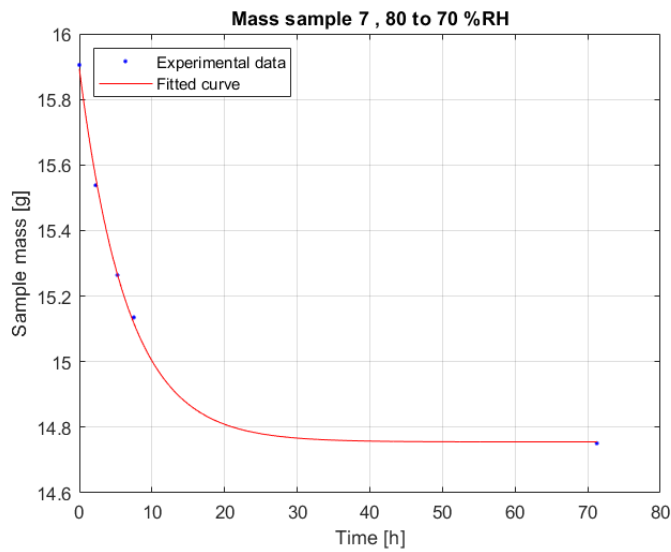
Sample 7:

Figure 2.104: fitted curve

SSE	1.07e-03
R-Square	0.999
DFE	2
Adjusted R-Square	0.997
RMSE	0.023
a	-1.138
c	15.893
End value	14.755
b	0.153

Table 2.91: Goodness of Fit

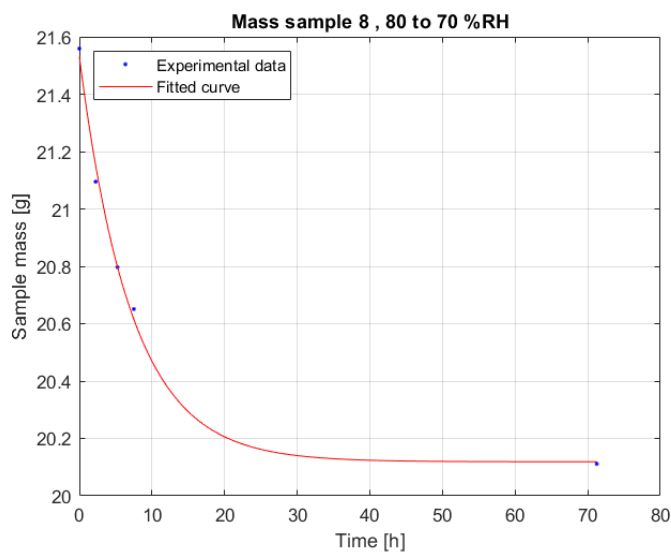
Sample 8:

Figure 2.105: fitted curve

SSE	5.24e-03
R-Square	0.995
DFE	2
Adjusted R-Square	0.991
RMSE	0.051
a	-1.412
c	21.530
End value	20.119
b	0.139

Table 2.92: Goodness of Fit

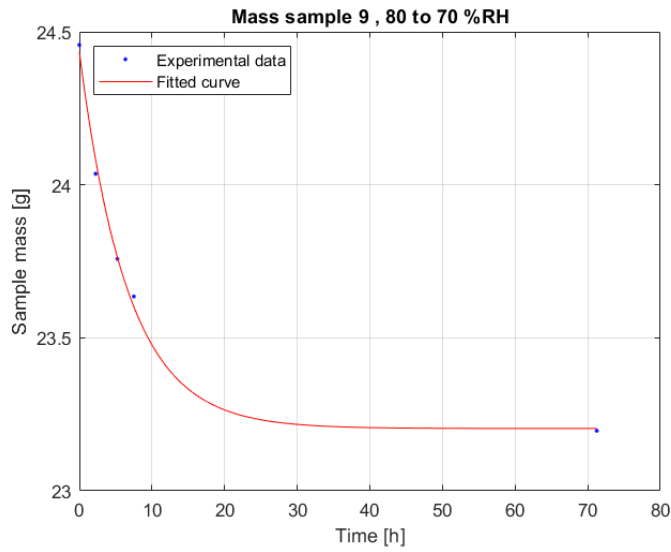
Sample 9:

Figure 2.106: fitted curve

SSE	3.71e-03
R-Square	0.996
DFE	2
Adjusted R-Square	0.992
RMSE	0.043
a	-1.231
c	24.434
End value	23.204
b	0.151

Table 2.93: Goodness of Fit

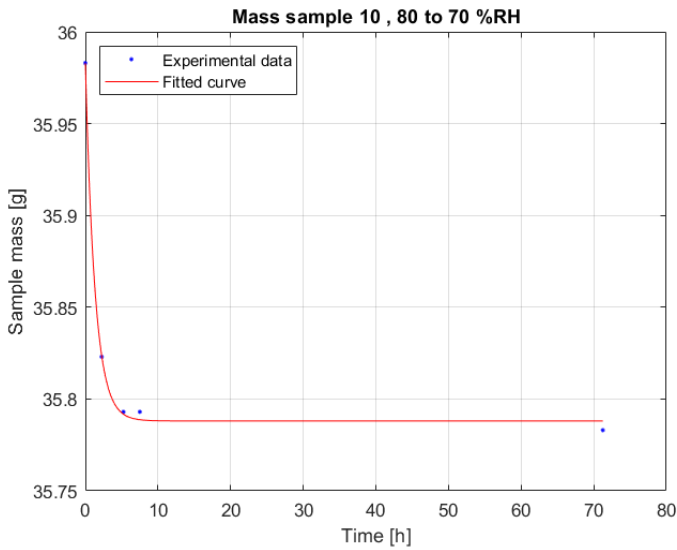
Sample 10:

Figure 2.107: fitted curve

SSE	4.58e-05
R-Square	0.998
DFE	2
Adjusted R-Square	0.997
RMSE	0.005
a	-0.195
c	35.983
End value	35.788
b	0.756

Table 2.94: Goodness of Fit

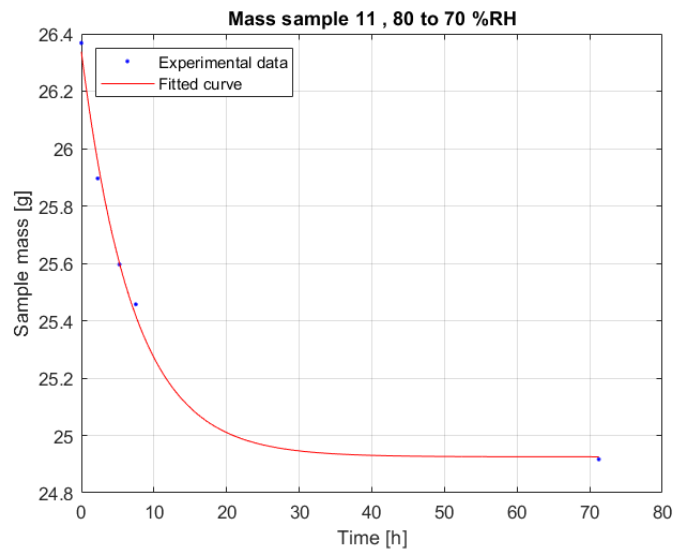
Sample 11:

Figure 2.108: fitted curve

SSE	6.02e-03
R-Square	0.995
DFE	2
Adjusted R-Square	0.990
RMSE	0.055
a	-1.412
c	26.338
End value	24.925
b	0.141

Table 2.95: Goodness of Fit

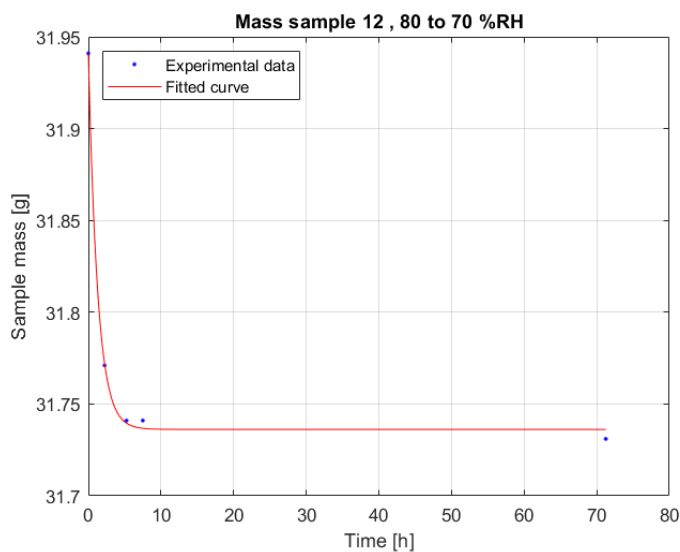
Sample 12:

Figure 2.109: fitted curve

SSE	4.71e-05
R-Square	0.998
DFE	2
Adjusted R-Square	0.997
RMSE	0.005
a	-0.205
c	31.941
End value	31.736
b	0.780

Table 2.96: Goodness of Fit

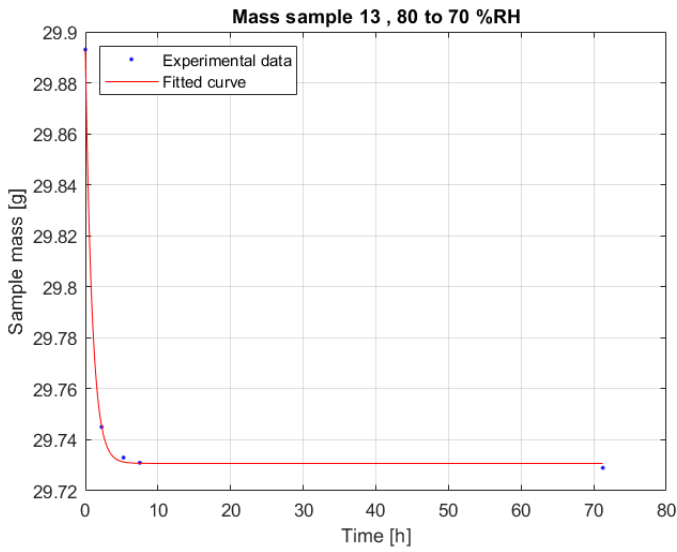
Sample 13:

Figure 2.110: fitted curve

SSE	5.95e-06
R-Square	1.000
DFE	2
Adjusted R-Square	0.999
RMSE	0.002
a	-0.162
c	29.893
End value	29.731
b	1.076

Table 2.97: Goodness of Fit

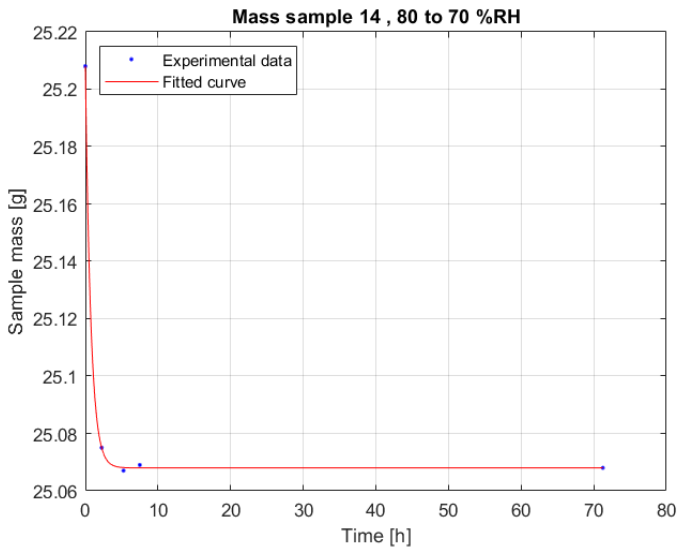
Sample 14:

Figure 2.111: fitted curve

SSE	2.26e-06
R-Square	1.000
DFE	2
Adjusted R-Square	1.000
RMSE	0.001
a	-0.140
c	25.208
End value	25.068
b	1.332

Table 2.98: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	1,75E-06	1,000	2	1,000	0,001	26,202	-0,150	26,052	0,940
2	9,46E-05	0,997	2	0,993	0,007	26,430	-0,193	26,237	0,704
3	5,02E-05	0,999	2	0,998	0,005	35,513	-0,235	35,278	0,845
4	1,16E-04	0,992	2	0,984	0,008	23,060	-0,137	22,923	0,842
5	6,87E-05	0,995	2	0,991	0,006	24,529	-0,140	24,389	0,969
6	6,61E-05	0,996	2	0,992	0,006	24,829	-0,145	24,684	1,075
7	1,07E-03	0,999	2	0,997	0,023	15,893	-1,138	14,755	0,153
8	5,24E-03	0,995	2	0,991	0,051	21,530	-1,412	20,119	0,139
9	3,71E-03	0,996	2	0,992	0,043	24,434	-1,231	23,204	0,151
10	4,58E-05	0,998	2	0,997	0,005	35,983	-0,195	35,788	0,756
11	6,02E-03	0,995	2	0,990	0,055	26,338	-1,412	24,925	0,141
12	4,71E-05	0,998	2	0,997	0,005	31,941	-0,205	31,736	0,780
13	5,95E-06	1,000	2	0,999	0,002	29,893	-0,162	29,731	1,076
14	2,26E-06	1,000	2	1,000	0,001	25,208	-0,140	25,068	1,332

Figure 2.112: Goodness of Fit and final values for step 80 to 70 %RH.

2.8 Step: 70 to 60 %RH

The obtained data for a step from 70 to 60 %RH:

Raw data

	Mon 17/1 09:15	Mon 17/1 12:15	Mon 17/1 15:15	Mon 17/1 17:30	Tue 18/1 08:45	Tue 18/1 12:30	
RH setpoint [%RH]	70	60	60	60	60	60	
RH measured [%RH]	70,0	60,0	60,2	60,0	60,2	60,0	
T measured [C]	21,7	21,7	21,7	21,7	21,7	21,7	
Time [h]	0,00	2,50	6,00	8,25	23,50	27,25	
Sample no.							
							FINAL DM/DT [g/h]
1	26,051	25,894	25,880	25,879	25,879	25,880	+0,001
2	26,230	26,022	25,986	25,978	25,972	25,966	-0,002
3	35,273	35,031	35,007	35,005	34,997	34,990	-0,007
4	22,915	22,773	22,760	22,759	22,758	22,755	-0,001
5	24,382	24,227	24,215	24,215	24,215	24,212	-0,001
6	24,678	24,527	24,515	24,515	24,513	24,508	-0,001
7	14,751	14,433	14,295	14,229	14,090	14,077	-0,013
8	20,111	19,687	19,455	19,371	19,200	19,192	-0,008
9	23,196	22,561	22,133	21,882	20,886	20,743	-0,143
10	35,783	35,593	35,563	35,553	35,543	35,543	+0,000
11	24,917	24,183	23,663	23,357	22,069	21,872	-0,197
12	31,731	31,541	31,511	31,511	31,501	31,501	+0,000
13	29,729	29,558	29,545	29,542	29,539	29,536	-0,003
14	25,068	24,905	24,895	24,894	24,889	24,890	-0,001
Empty	-0,018	-0,019	-0,020	-0,020	-0,020	-0,020	+0,000

Figure 2.113: Mass of samples for a step from 70 to 60 %RH.

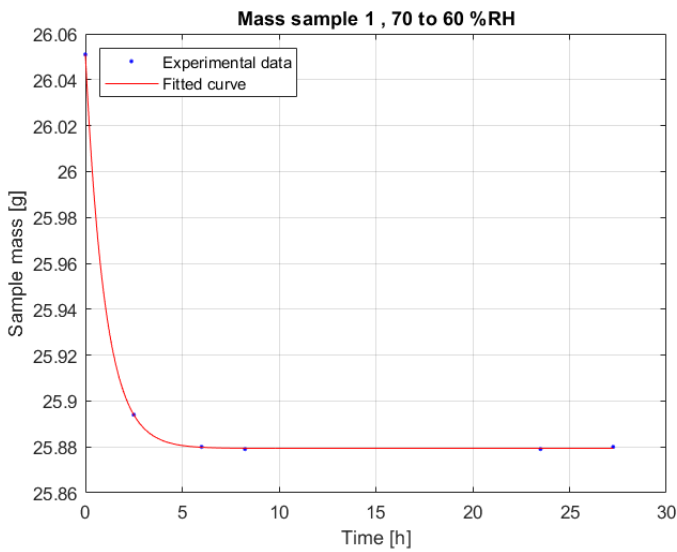
Sample 1:

Figure 2.114: fitted curve

SSE	7.38e-07
R-Square	1.000
DFE	3
Adjusted R-Square	1.000
RMSE	0.000
a	-0.172
c	26.051
End value	25.879
b	0.984

Table 2.99: Goodness of Fit

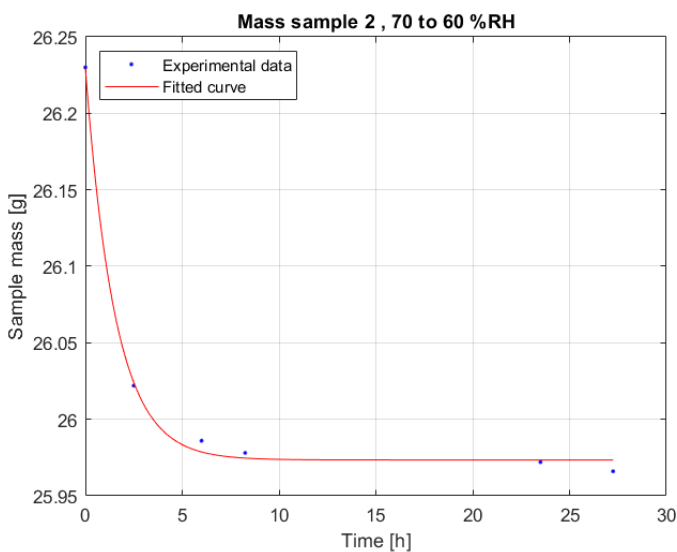
Sample 2:

Figure 2.115: fitted curve

SSE	1.72e-04
R-Square	0.998
DFE	3
Adjusted R-Square	0.996
RMSE	0.006
a	-0.256
c	26.230
End value	25.973
b	0.648

Table 2.100: Goodness of Fit

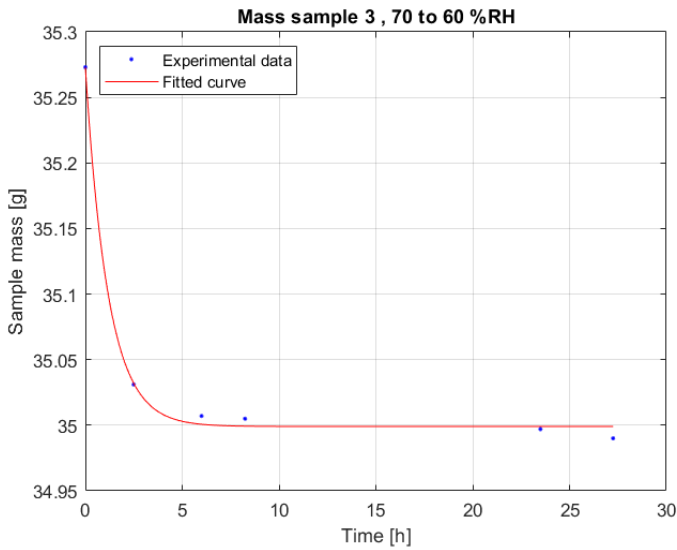
Sample 3:

Figure 2.116: fitted curve

SSE	1.59e-04
R-Square	0.997
DFE	3
Adjusted R-Square	0.996
RMSE	0.007
a	-0.274
c	35.273
End value	34.999
b	0.848

Table 2.101: Goodness of Fit

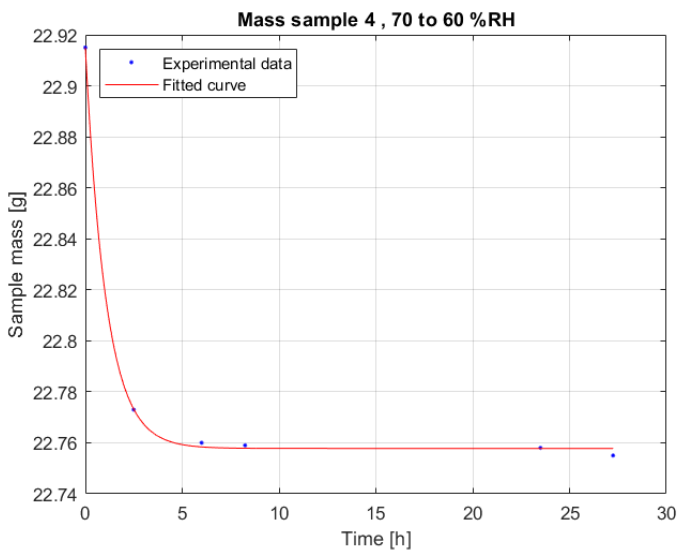
Sample 4:

Figure 2.117: fitted curve

SSE	1.18e-05
R-Square	0.999
DFE	3
Adjusted R-Square	0.999
RMSE	0.002
a	-0.157
c	22.915
End value	22.758
b	0.930

Table 2.102: Goodness of Fit

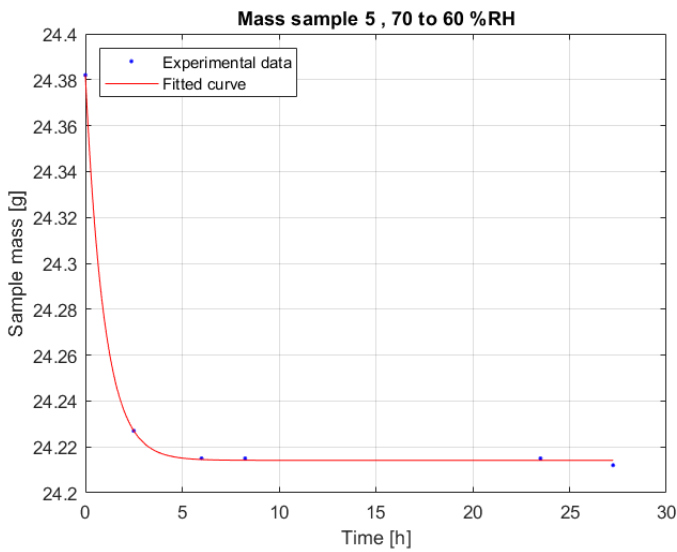
Sample 5:

Figure 2.118: fitted curve

SSE	6.26e-06
R-Square	1.000
DFE	3
Adjusted R-Square	1.000
RMSE	0.001
a	-0.168
c	24.382
End value	24.214
b	1.026

Table 2.103: Goodness of Fit

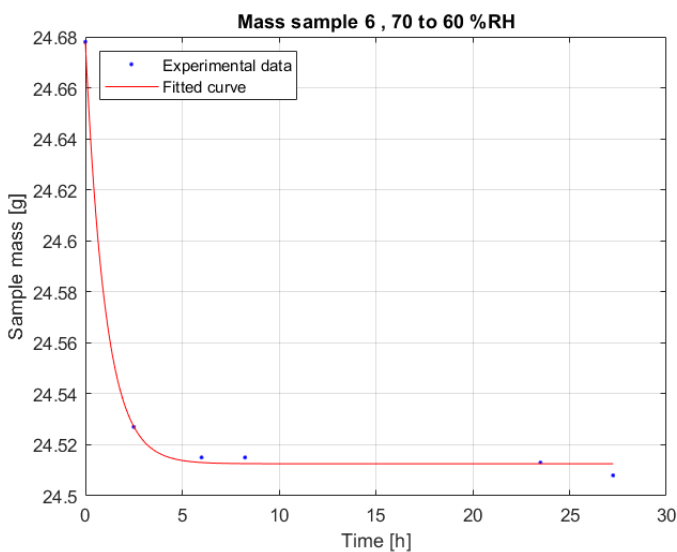
Sample 6:

Figure 2.119: fitted curve

SSE	3.05e-05
R-Square	0.999
DFE	3
Adjusted R-Square	0.998
RMSE	0.003
a	-0.165 heightc
24.678	
End value	24.513
b	0.971

Table 2.104: Goodness of Fit

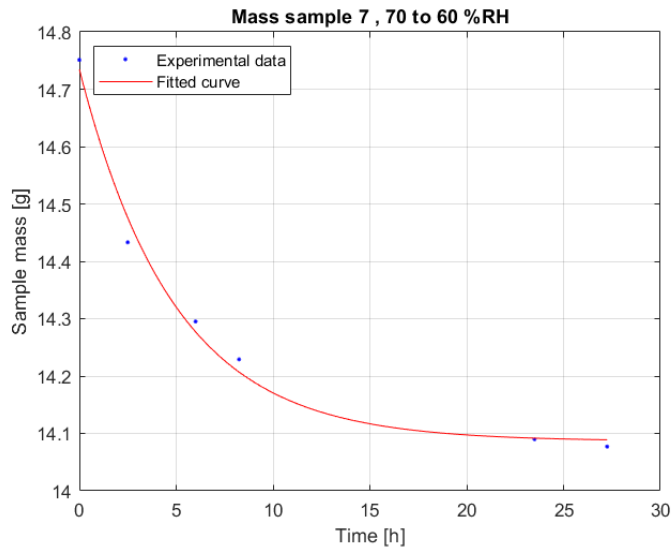
Sample 7:

Figure 2.120: fitted curve

SSE	3.05e-03
R-Square	0.990
DFE	3
Adjusted R-Square	0.984
RMSE	0.032
a	-0.684
c	14.735
End value	14.086
b	0.204

Table 2.105: Goodness of Fit

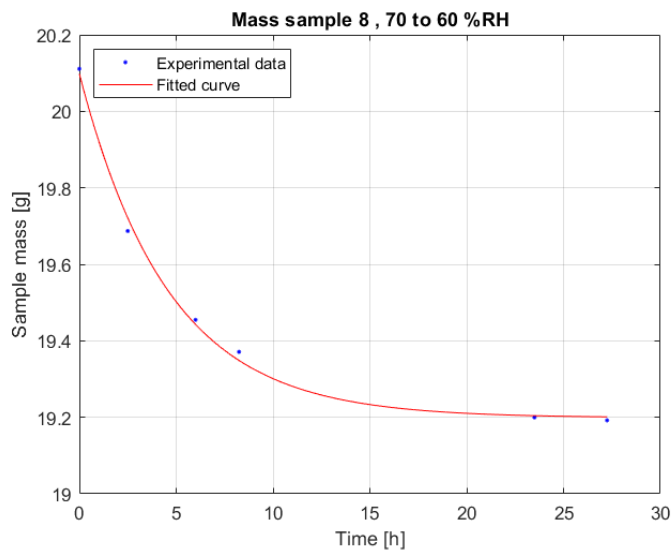
Sample 8:

Figure 2.121: fitted curve

SSE	2.09e-03
R-Square	0.997
DFE	3
Adjusted R-Square	0.994
RMSE	0.026
a	-0.899
c	20.098
End value	19.199
b	0.217

Table 2.106: Goodness of Fit

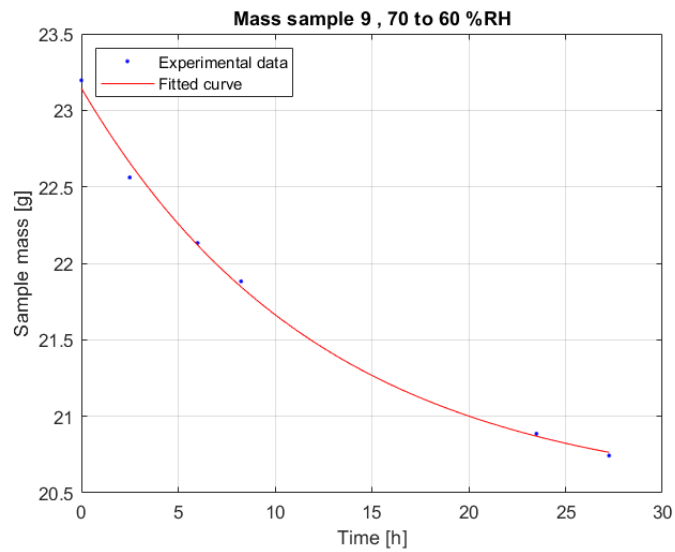
Sample 9:

Figure 2.122: fitted curve

SSE	1.41e-02
R-Square	0.997
DFE	3
Adjusted R-Square	0.995
RMSE	0.068
a	-2.681
c	23.145
End value	20.464
b	0.080

Table 2.107: Goodness of Fit

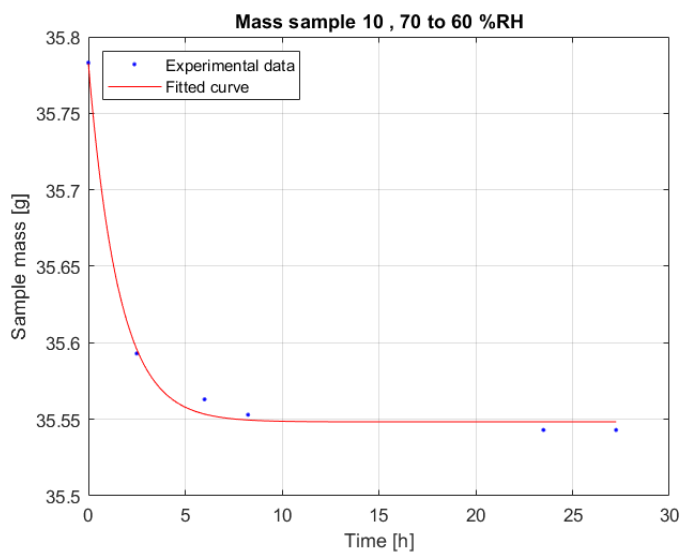
Sample 10:

Figure 2.123: fitted curve

SSE	1.69e-04
R-Square	0.996
DFE	3
Adjusted R-Square	0.994
RMSE	0.008
a	-0.234
c	35.783
End value	35.548
b	0.639

Table 2.108: Goodness of Fit

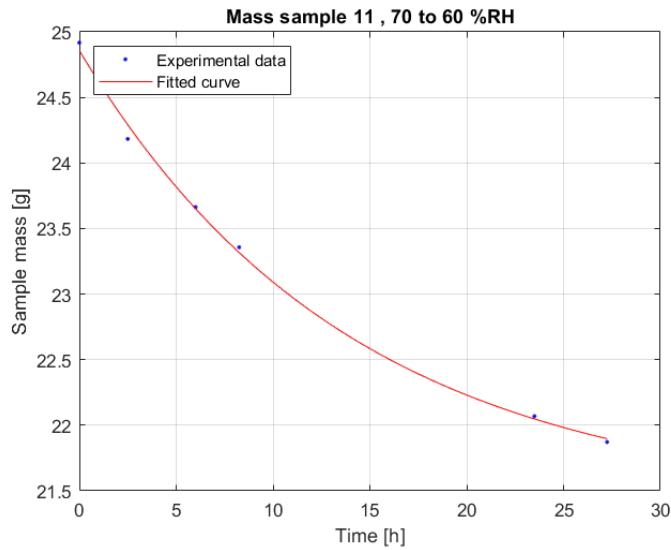
Sample 11:

Figure 2.124: fitted curve

SSE	1.81e-02
R-Square	0.997
DFE	3
Adjusted R-Square	0.996
RMSE	0.078
a	-3.448
c	24.857
End value	21.410
b	0.072

Table 2.109: Goodness of Fit

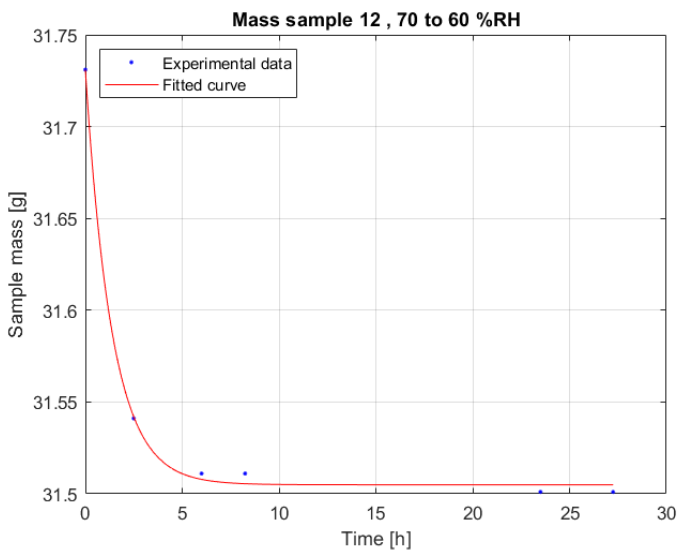
Sample 12:

Figure 2.125: fitted curve

SSE	7.18e-05
R-Square	0.998
DFE	3
Adjusted R-Square	0.997
RMSE	0.005
a	-0.226
c	31.731
End value	31.505
b	0.724

Table 2.110: Goodness of Fit

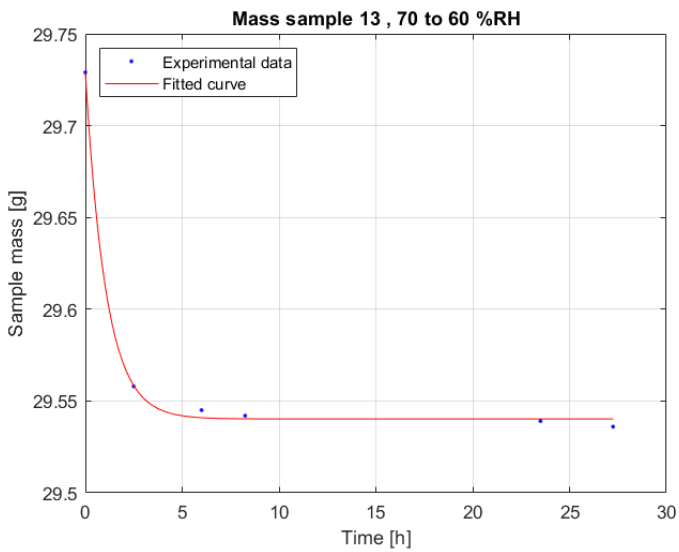
Sample 13:

Figure 2.126: fitted curve

SSE	3.91e-05
R-Square	0.999
DFE	3
Adjusted R-Square	0.998
RMSE	0.004
a	-0.189
c	29.729
End value	29.540
b	0.936

Table 2.111: Goodness of Fit

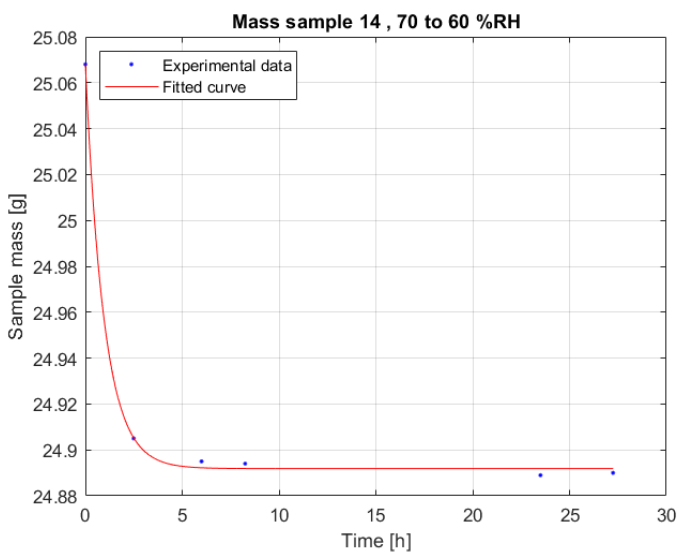
Sample 14:

Figure 2.127: fitted curve

SSE	2.38e-05
R-Square	0.999
DFE	3
Adjusted R-Square	0.998
RMSE	0.003
a	-0.176
c	25.068
End value	24.892
b	1.032

Table 2.112: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	7,38E-07	1,000	3	1,000	0,000	26,051	-0,172	25,879	0,984
2	1,27E-04	0,998	3	0,996	0,006	26,230	-0,256	25,973	0,648
3	1,59E-04	0,997	3	0,996	0,007	35,273	-0,274	34,999	0,848
4	1,18E-05	0,999	3	0,999	0,002	22,915	-0,157	22,758	0,930
5	6,26E-06	1,000	3	1,000	0,001	24,382	-0,168	24,214	1,026
6	3,05E-05	0,999	3	0,998	0,003	24,678	-0,165	24,513	0,971
7	3,05E-03	0,990	3	0,984	0,032	14,735	-0,648	14,086	0,204
8	2,09E-03	0,997	3	0,994	0,026	20,098	-0,899	19,199	0,217
9	1,41E-02	0,997	3	0,995	0,068	23,145	-2,681	20,464	0,080
10	1,69E-04	0,996	3	0,994	0,008	35,783	-0,234	35,548	0,639
11	1,81E-02	0,997	3	0,996	0,078	24,857	-3,448	21,410	0,072
12	7,18E-05	0,998	3	0,997	0,005	31,731	-0,226	31,505	0,724
13	3,91E-05	0,999	3	0,998	0,004	29,729	-0,189	29,540	0,936
14	2,38E-05	0,999	3	0,998	0,003	25,068	-0,176	24,892	1,032

Figure 2.128: Goodness of Fit and final values for step 70 to 60 %RH.

2.9 Step: 60 to 50 %RH

The obtained data for a step from 60 to 50 %RH:

Raw data

	Tue 18/1 12:45	Tue 18/1 15:00	Tue 18/1 17:30	Wed 19/1 09:00	Wed 19/1 12:45	Wed 19/1 17:15	Thu 20/1 08:45	
RH setpoint [%RH]	60	50	50	50	50	50	50	
RH measured [%RH]	60,0	50,0	50,1	50,5	50,0	50,1	50,5	
T measured [C]	21,7	21,7	21,7	21,7	21,7	21,7	21,7	
Time [h]	0,00	2,25	4,75	20,25	24,00	28,50	44,00	
Sample no.								FINAL DM/DT [g/h]
1	25,880	25,702	25,676	25,657	25,654	25,655	25,646	-0,001
2	25,966	25,747	25,689	25,633	25,629	25,627	25,616	-0,001
3	34,990	34,738	34,692	34,655	34,648	34,644	34,628	-0,001
4	22,755	22,597	22,569	22,554	22,550	22,549	22,544	-0,000
5	24,212	24,041	24,018	24,003	24,002	23,999	23,995	-0,000
6	24,508	24,338	24,322	24,305	24,304	24,300	24,295	-0,000
7	14,077	13,915	13,861	13,791	13,791	13,790	13,790	+0,000
8	19,192	18,985	18,906	18,867	18,863	18,864	18,863	-0,000
9	20,743	20,257	19,943	18,836	18,678	18,534	18,239	-0,019
10	35,543	35,353	35,313	35,273	35,273	35,273	35,263	-0,001
11	21,872	21,314	20,960	19,675	19,500	19,336	19,025	-0,020
12	31,501	31,291	31,241	31,191	31,191	31,181	31,181	+0,000
13	29,536	29,360	29,325	29,314	29,312	29,311	29,312	+0,000
14	24,890	24,664	24,589	24,497	24,488	24,480	24,475	-0,000
Empty	-0,020	-0,020	-0,021	-0,020	-0,021	-0,020	-0,017	+0,000

Figure 2.129: Mass of samples for a step from 60 to 50 %RH.

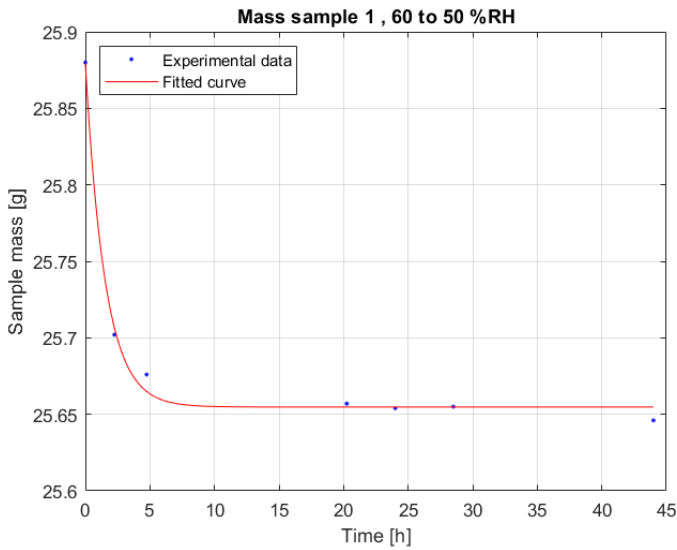
Sample 1:

Figure 2.130: fitted curve

SSE	2.27e-04
R-Square	0.995
DFE	4
Adjusted R-Square	0.992
RMSE	0.008
a	-0.225
c	25.879
End value	25.655
b	0.652

Table 2.113: Goodness of Fit

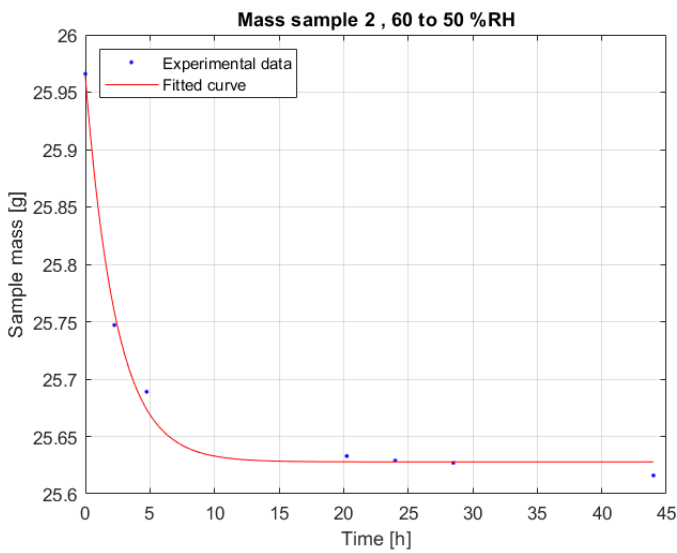
Sample 2:

Figure 2.131: fitted curve

SSE	5.43e-04
R-Square	0.994
DFE	4
Adjusted R-Square	0.991
RMSE	0.012
a	-0.336
c	25.964
End value	25.628
b	0.420

Table 2.114: Goodness of Fit

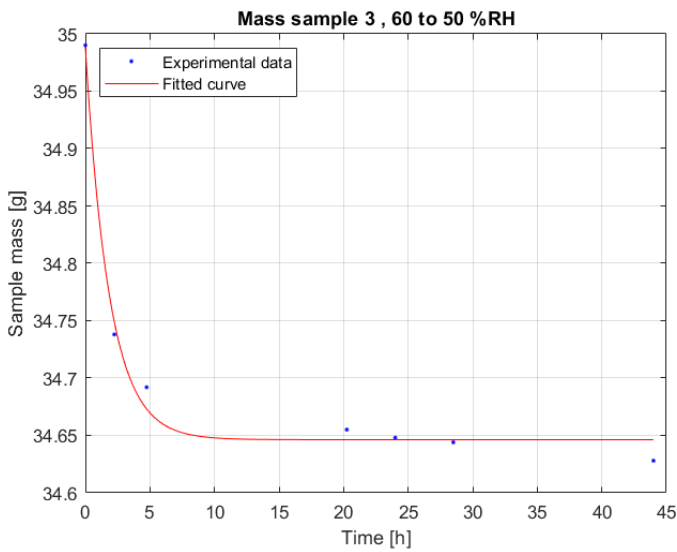
Sample 3:

Figure 2.132: fitted curve

SSE	8.93e-04
R-Square	0.991
DFE	4
Adjusted R-Square	0.986
RMSE	0.015
a	-0.342
c	34.988
End value	34.646
b	0.536

Table 2.115: Goodness of Fit

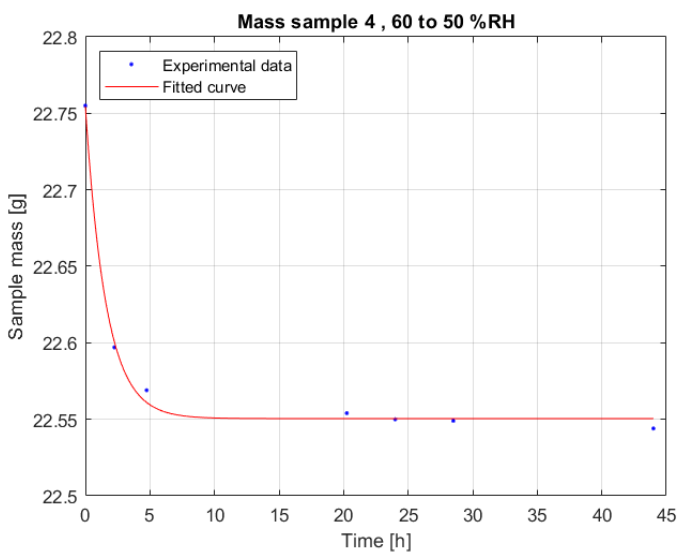
Sample 4:

Figure 2.133: fitted curve

SSE	1.34e-04
R-Square	0.996
DFE	4
Adjusted R-Square	0.994
RMSE	0.006
a	-0.204
c	22.755
End value	22.550
b	0.624

Table 2.116: Goodness of Fit

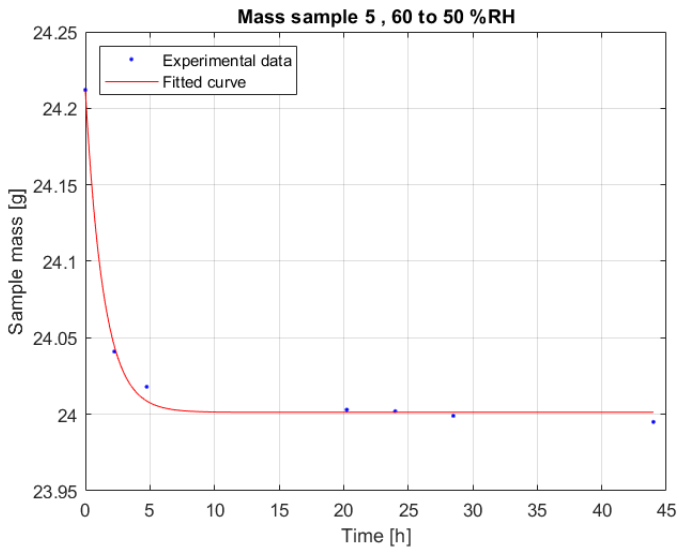
Sample 5:

Figure 2.134: fitted curve

SSE	1.46e-04
R-Square	0.996
DFE	4
Adjusted R-Square	0.994
RMSE	0.006
a	-0.210
c	24.212
End value	24.001
b	0.704

Table 2.117: Goodness of Fit

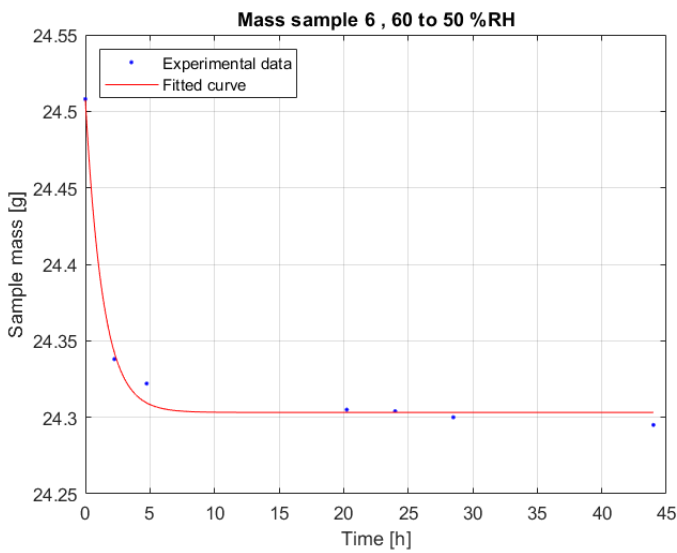
Sample 6:

Figure 2.135: fitted curve

SSE	2.58e-04
R-Square	0.993
DFE	4
Adjusted R-Square	0.989
RMSE	0.008
a	-0.204
c	24.508
End value	24.303
b	0.735

Table 2.118: Goodness of Fit

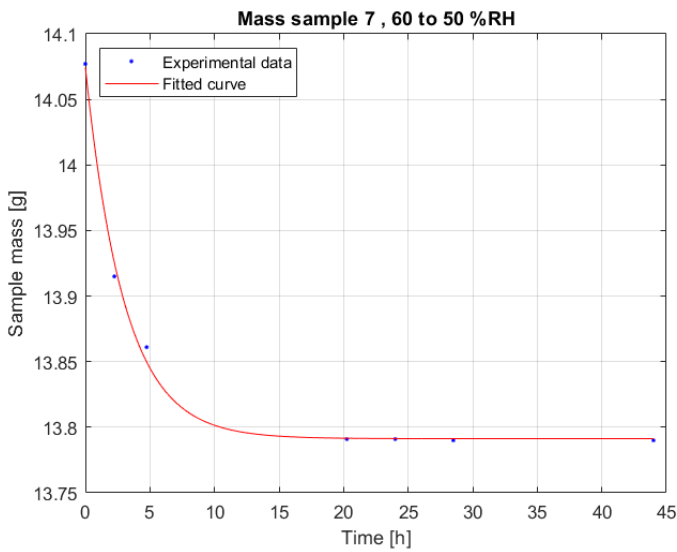
Sample 7:

Figure 2.136: fitted curve

SSE	2.45e-04
R-Square	0.996
DFE	4
Adjusted R-Square	0.995
RMSE	0.008
a	-0.283
c	14.074
End value	13.791
b	0.332

Table 2.119: Goodness of Fit

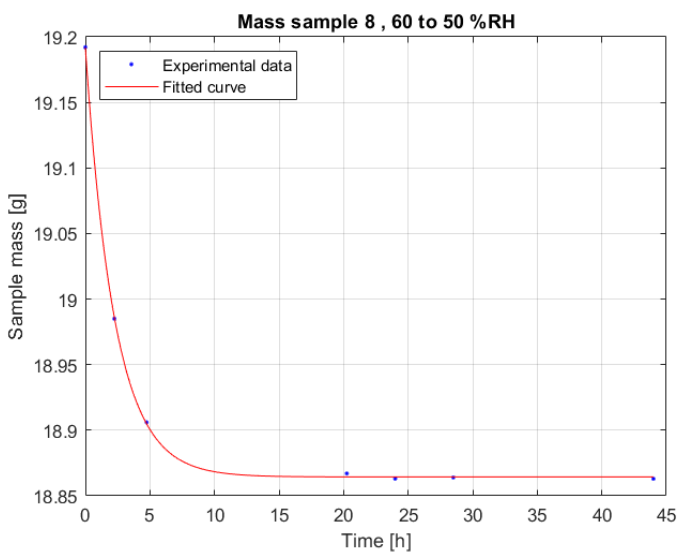
Sample 8:

Figure 2.137: fitted curve

SSE	1.30e-05
R-Square	1.000
DFE	4
Adjusted R-Square	1.000
RMSE	0.002
a	-0.327
c	19.192
End value	18.864
b	0.441

Table 2.120: Goodness of Fit

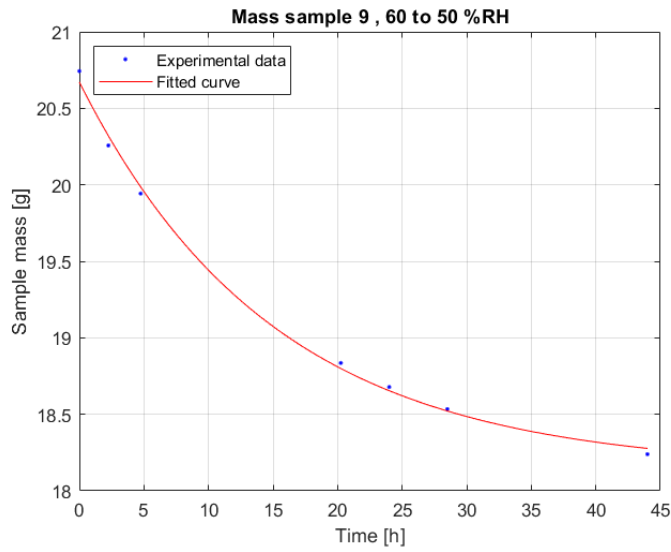
Sample 9:

Figure 2.138: fitted curve

SSE	1.44e-02
R-Square	0.997
DFE	4
Adjusted R-Square	0.996
RMSE	0.060
a	-2.530
c	20.672
End value	18.142
b	0.067

Table 2.121: Goodness of Fit

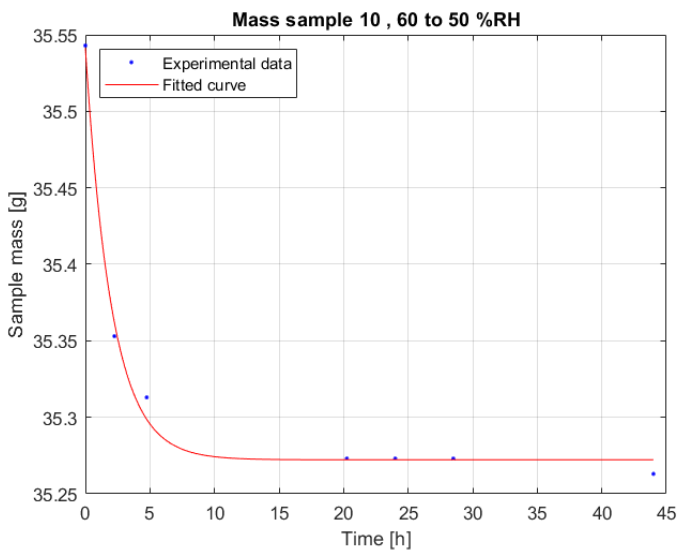
Sample 10:

Figure 2.139: fitted curve

SSE	3.74e-04
R-Square	0.994
DFE	4
Adjusted R-Square	0.991
RMSE	0.010
a	-0.269
c	35.541
End value	35.272
b	0.488

Table 2.122: Goodness of Fit

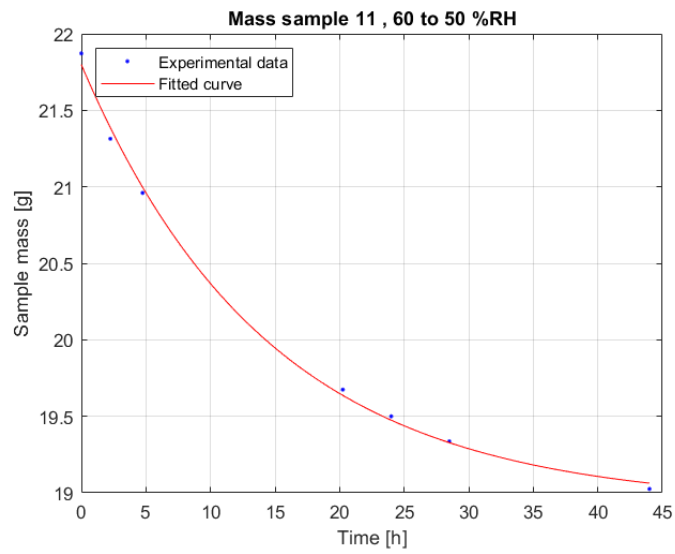
Sample 11:

Figure 2.140: fitted curve

SSE	1.55e-02
R-Square	0.998
DFE	4
Adjusted R-Square	0.997
RMSE	0.062
a	-2.874
c	21.798
End value	18.924
b	0.069

Table 2.123: Goodness of Fit

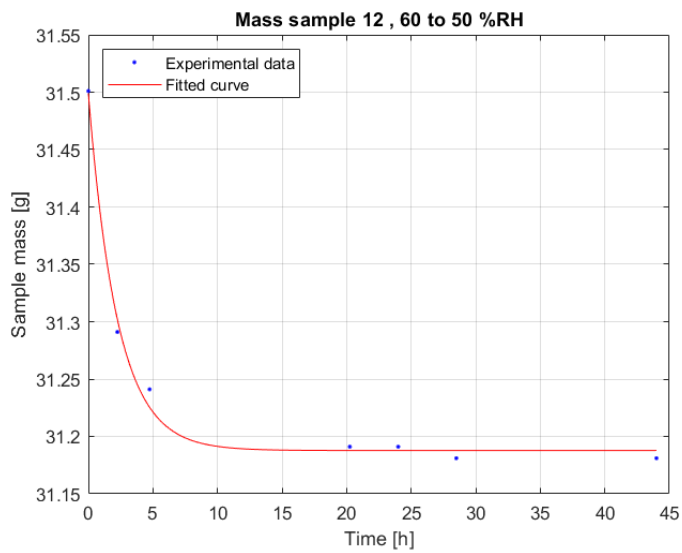
Sample 12:

Figure 2.141: fitted curve

SSE	4.84e-04
R-Square	0.994
DFE	4
Adjusted R-Square	0.991
RMSE	0.011
a	-0.311
c	31.499
End value	31.188
b	0.445

Table 2.124: Goodness of Fit

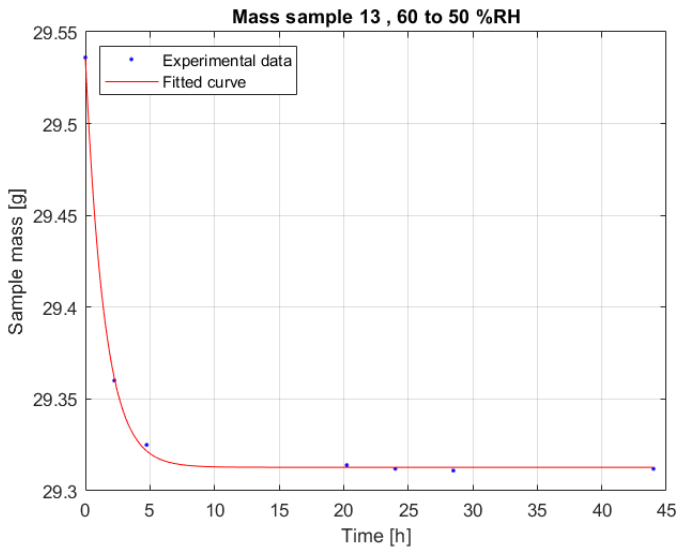
Sample 13:

Figure 2.142: fitted curve

SSE	1.86e-05
R-Square	1.000
DFE	4
Adjusted R-Square	0.999
RMSE	0.002
a	-0.223
c	29.536
End value	29.313
b	0.678

Table 2.125: Goodness of Fit

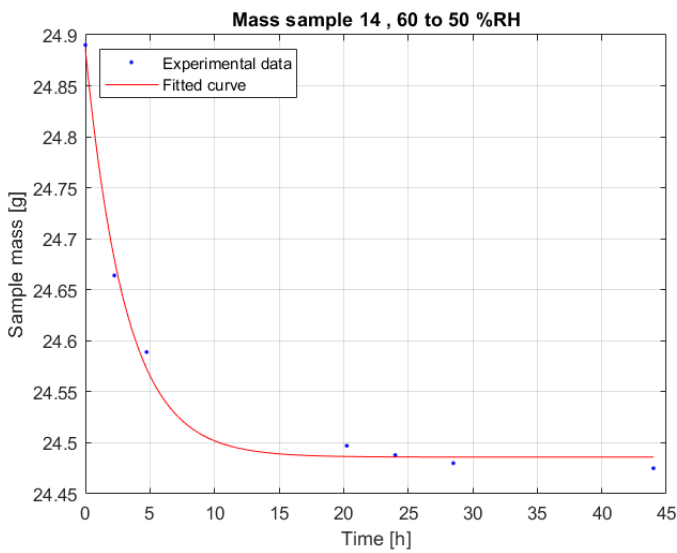
Sample 14:

Figure 2.143: fitted curve

SSE	8.03e-04
R-Square	0.994
DFE	4
Adjusted R-Square	0.991
RMSE	0.014
a	-0.400
c	24.886
End value	24.486
b	0.322

Table 2.126: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	2,27E-04	0,995	4	0,992	0,008	25,879	-0,225	25,655	0,652
2	5,43E-04	0,994	4	0,991	0,012	25,964	-0,336	25,628	0,420
3	8,93E-04	0,991	4	0,986	0,015	34,988	-0,342	34,646	0,536
4	1,34E-04	0,996	4	0,994	0,006	22,755	-0,204	22,550	0,624
5	1,46E-04	0,996	4	0,994	0,006	24,212	-0,210	24,001	0,704
6	2,58E-04	0,993	4	0,989	0,008	24,508	-0,204	24,303	0,735
7	2,45E-04	0,996	4	0,995	0,008	14,074	-0,283	13,791	0,332
8	1,30E-05	1,000	4	1,000	0,002	19,192	-0,327	18,864	0,441
9	1,44E-02	0,997	4	0,996	0,060	20,672	-2,530	18,142	0,067
10	3,74E-04	0,994	4	0,991	0,010	35,541	-0,269	35,272	0,488
11	1,55E-02	0,998	4	0,997	0,062	21,798	-2,874	18,924	0,069
12	4,84E-04	0,994	4	0,991	0,011	31,499	-0,311	31,188	0,445
13	1,86E-05	1,000	4	0,999	0,002	29,536	-0,223	29,313	0,678
14	8,03E-04	0,994	4	0,991	0,014	24,886	-0,400	24,486	0,322

Figure 2.144: Goodness of Fit and final values for step 60 to 50 %RH.

2.10 Step: 50 to 40 %RH

The obtained data for a step from 50 to 40 %RH:

Raw data

	Thu 20/1 09:00	Thu 20/1 12:15	Thu 20/1 16:30	Fri 21/1 09:30	Fri 21/1 12:15	
RH setpoint [%RH]	50	40	40	40	40	
RH measured [%RH]	50,5	40,4	40,5	40,7	40,4	
T measured [C]	21,7	21,7	21,7	21,7	21,7	
Time [h]	0,00	3,25	7,50	24,50	27,00	
Sample no.						
						FINAL DM/DT [g/h]
1	25,646	25,423	25,384	25,366	25,362	-0,002
2	25,616	25,325	25,228	25,175	25,169	-0,002
3	34,628	34,169	33,891	33,574	33,547	-0,011
4	22,544	22,334	22,300	22,284	22,277	-0,003
5	23,995	23,773	23,749	23,734	23,729	-0,002
6	24,295	24,077	24,056	24,039	24,033	-0,002
7	13,790	13,659	13,632	13,628	13,624	-0,002
8	18,863	18,702	18,679	18,676	18,672	-0,002
9	18,239	17,914	17,674	17,256	17,217	-0,016
10	35,263	35,023	34,963	34,933	34,933	+0,000
11	19,025	18,687	18,491	18,190	18,169	-0,008
12	31,181	30,861	30,711	30,541	30,531	-0,004
13	29,312	29,080	29,040	29,019	29,022	+0,001
14	24,475	23,939	23,554	22,889	22,818	-0,028
Empty	-0,017	-0,020	-0,019	-0,022	-0,023	-0,000

Figure 2.145: Mass of samples for a step from 50 to 40 %RH.

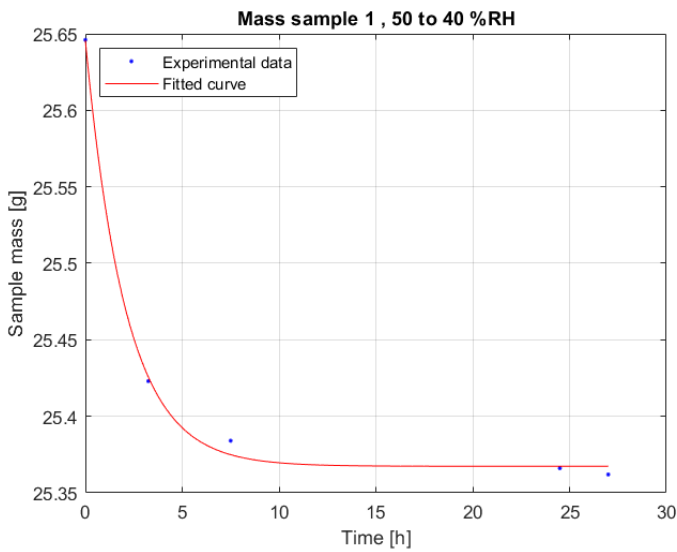
Sample 1:

Figure 2.146: fitted curve

SSE	1.20e-04
R-Square	0.998
DFE	2
Adjusted R-Square	0.996
RMSE	0.008
a	-0.278
c	25.646
End value	25.367
b	0.480

Table 2.127: Goodness of Fit

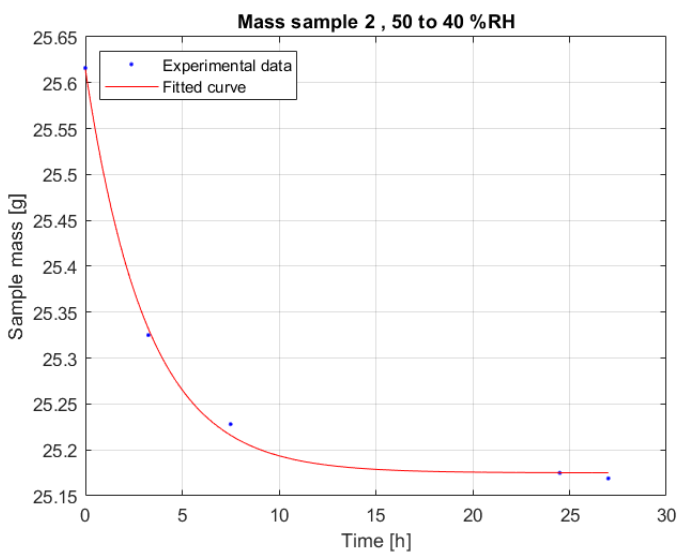
Sample 2:

Figure 2.147: fitted curve

SSE	2.36e-04
R-Square	0.998
DFE	2
Adjusted R-Square	0.997
RMSE	0.011
a	-0.440
c	25.615
End value	25.175
b	0.316

Table 2.128: Goodness of Fit

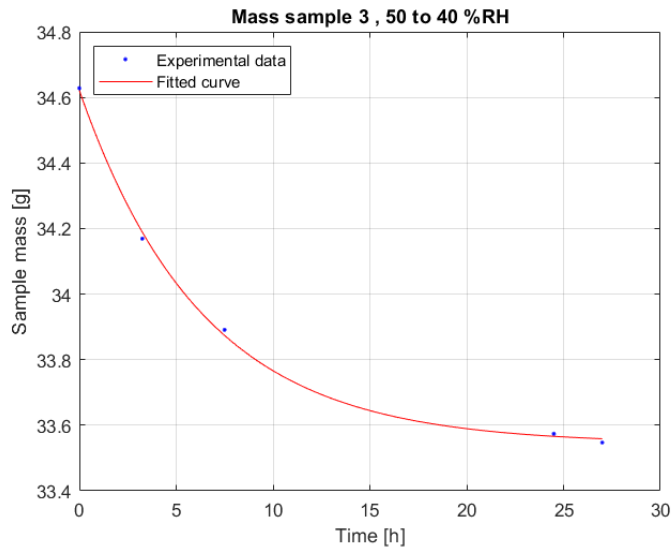
Sample 3:

Figure 2.148: fitted curve

SSE	9.45e-04
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.022
a	-1.078
c	34.621
End value	33.543
b	0.158

Table 2.129: Goodness of Fit

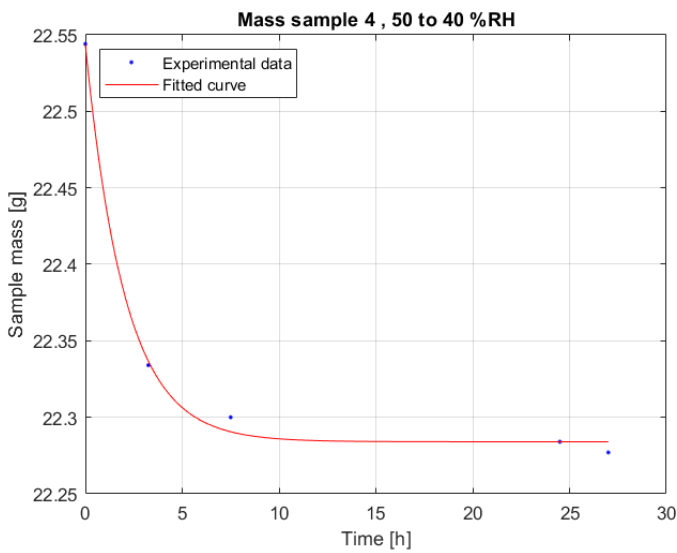
Sample 4:

Figure 2.149: fitted curve

SSE	1.46e-04
R-Square	0.997
DFE	2
Adjusted R-Square	0.994
RMSE	0.009
a	-0.260
c	22.544
End value	22.284
b	0.491

Table 2.130: Goodness of Fit

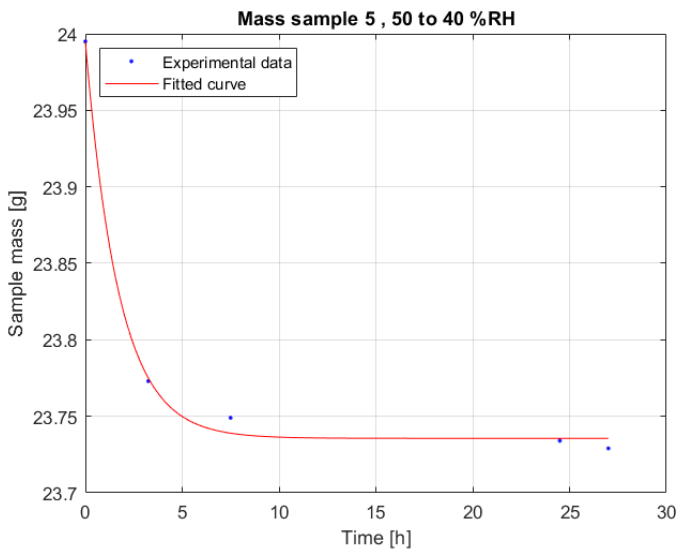
Sample 5:

Figure 2.150: fitted curve

SSE	1.51e-04
R-Square	0.997
DFE	2
Adjusted R-Square	0.994
RMSE	0.009
a	-0.259
c	23.995
End value	23.736
b	0.579

Table 2.131: Goodness of Fit

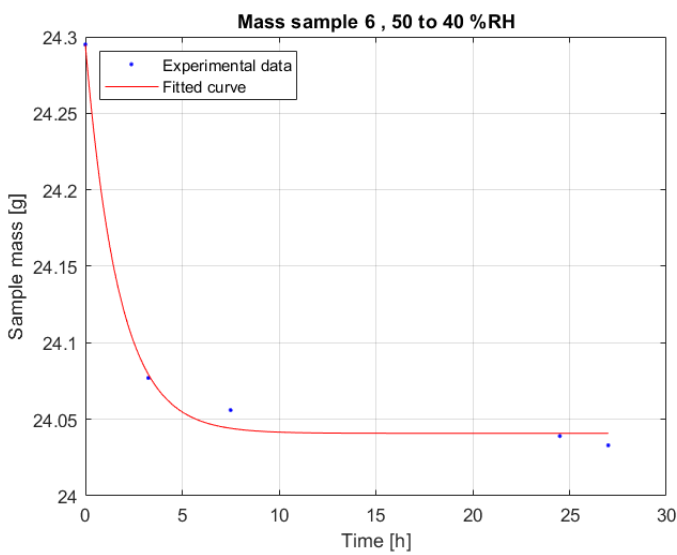
Sample 6:

Figure 2.151: fitted curve

SSE	2.12e-04
R-Square	0.996
DFE	2
Adjusted R-Square	0.991
RMSE	0.010
a	-0.254 heightc
24.295	
End value	24.041
b	0.580

Table 2.132: Goodness of Fit

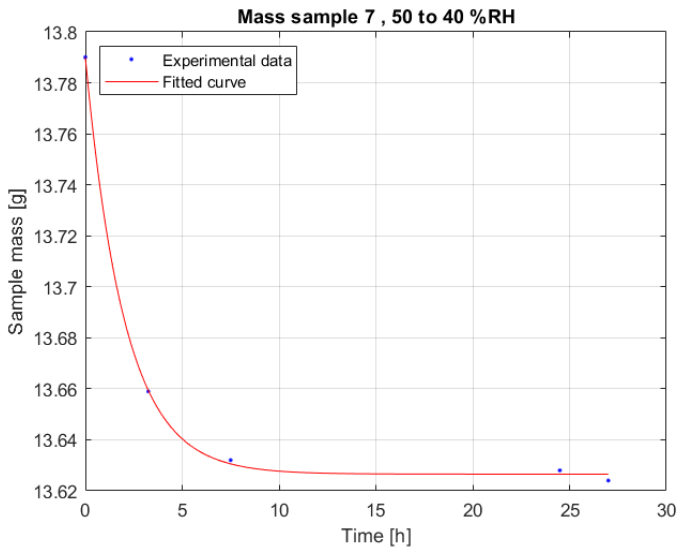
Sample 7:

Figure 2.152: fitted curve

SSE	1.08e-05
R-Square	0.999
DFE	2
Adjusted R-Square	0.999
RMSE	0.002
a	-0.163
c	13.790
End value	13.627
b	0.493

Table 2.133: Goodness of Fit

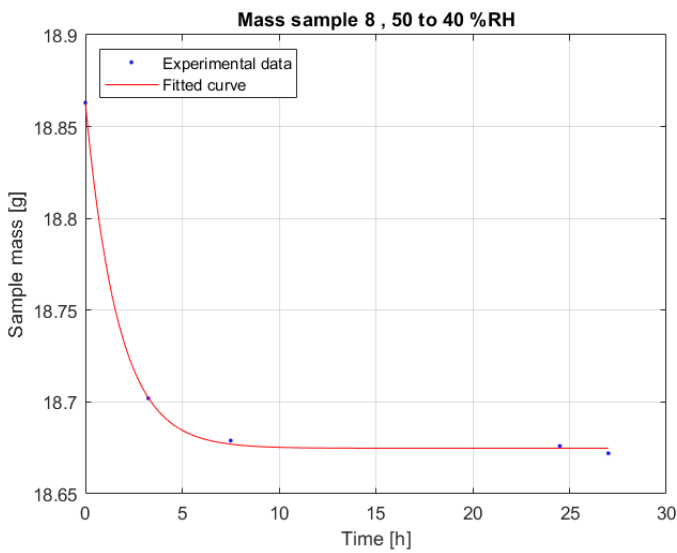
Sample 8:

Figure 2.153: fitted curve

SSE	1.33e-05
R-Square	1.000
DFE	2
Adjusted R-Square	0.999
RMSE	0.003
a	-0.188
c	18.863
End value	18.675
b	0.591

Table 2.134: Goodness of Fit

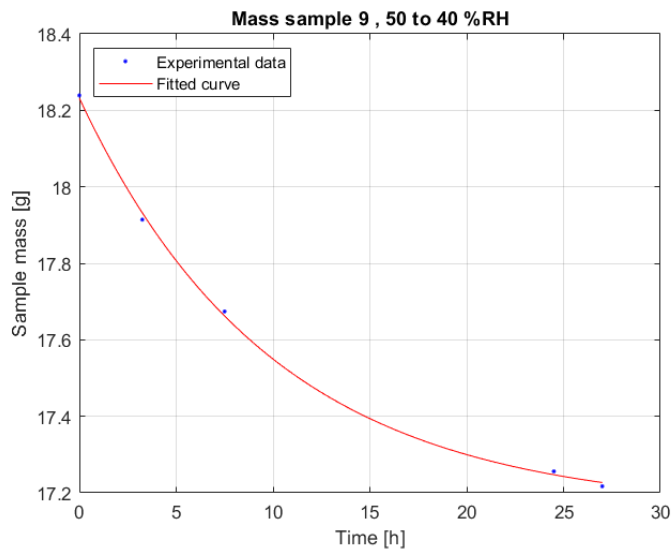
Sample 9:

Figure 2.154: fitted curve

SSE	6.90e-04
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.019
a	-1.076
c	18.232
End value	17.155
b	0.100

Table 2.135: Goodness of Fit

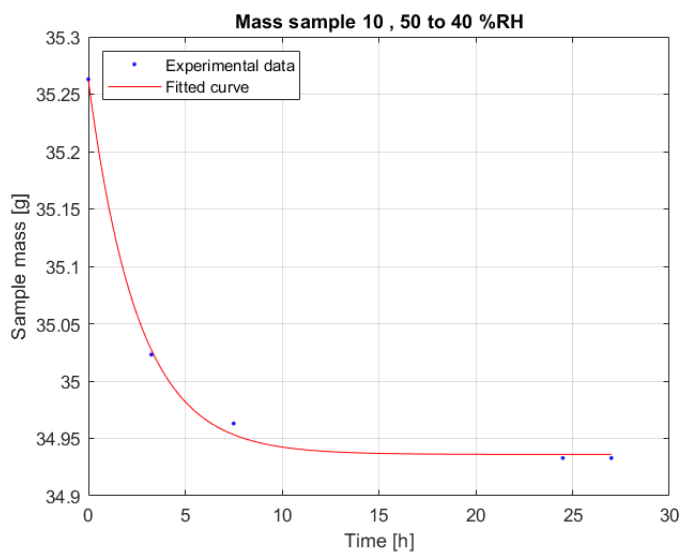
Sample 10:

Figure 2.155: fitted curve

SSE	1.32e-04
R-Square	0.998
DFE	2
Adjusted R-Square	0.997
RMSE	0.008
a	-0.326
c	35.262
End value	34.936
b	0.392

Table 2.136: Goodness of Fit

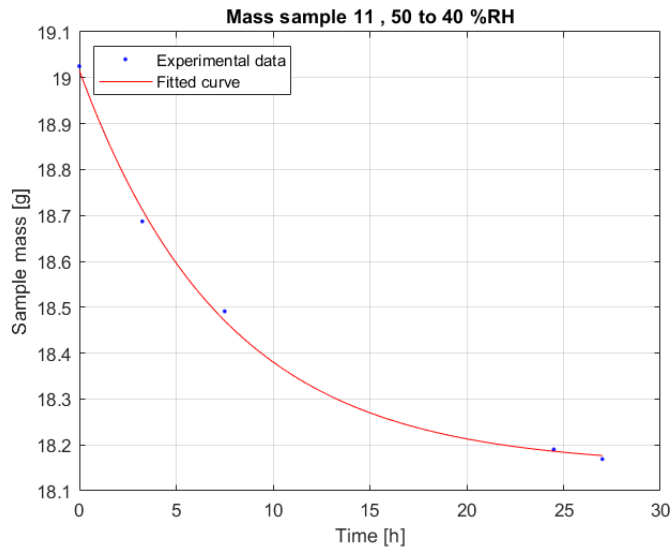
Sample 11:

Figure 2.156: fitted curve

SSE	1.23e-03
R-Square	0.998
DFE	2
Adjusted R-Square	0.995
RMSE	0.025
a	-0.863
c	19.016
End value	18.153
b	0.133

Table 2.137: Goodness of Fit

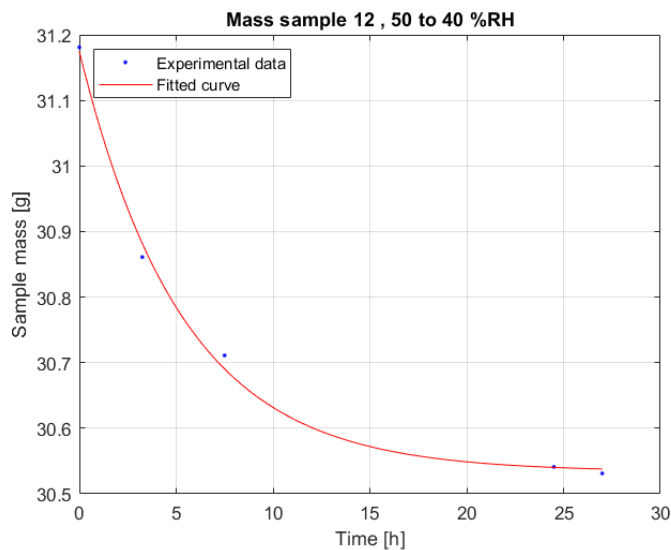
Sample 12:

Figure 2.157: fitted curve

SSE	9.44e-04
R-Square	0.997
DFE	2
Adjusted R-Square	0.993
RMSE	0.022
a	-0.641
c	31.175
End value	30.534
b	0.188

Table 2.138: Goodness of Fit

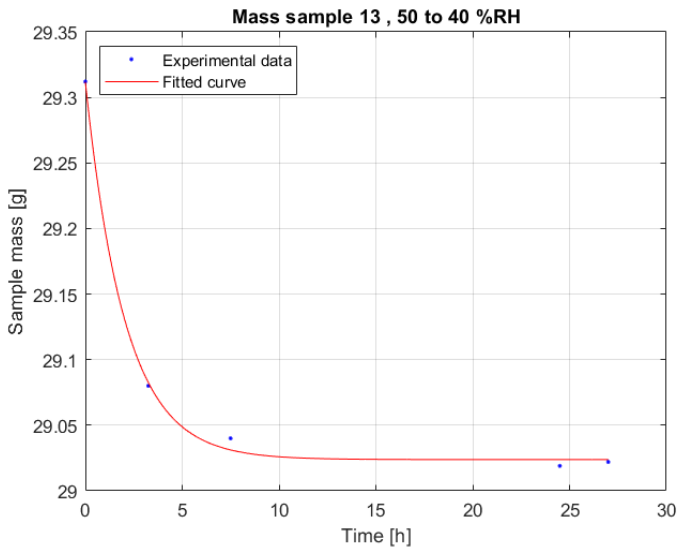
Sample 13:

Figure 2.158: fitted curve

SSE	1.11e-04
R-Square	0.998
DFE	2
Adjusted R-Square	0.996
RMSE	0.007
a	-0.288
c	29.312
End value	29.024
b	0.489

Table 2.139: Goodness of Fit

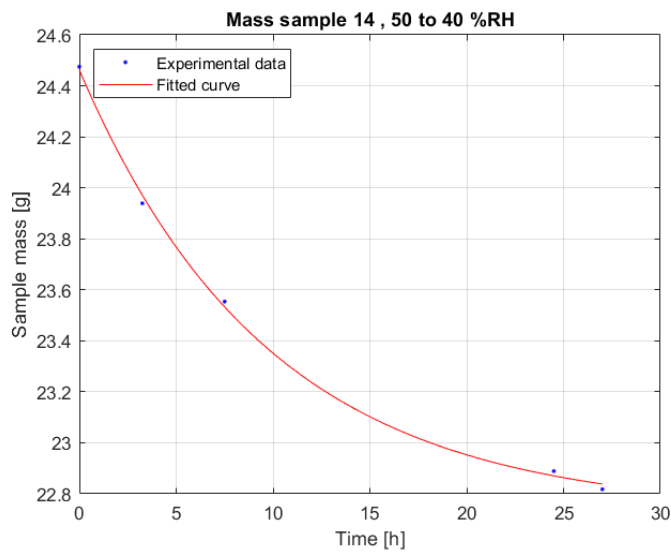
Sample 14:

Figure 2.159: fitted curve

SSE	2.43e-03
R-Square	0.999
DFE	2
Adjusted R-Square	0.998
RMSE	0.035
a	-1.732
c	24.462
End value	22.729
b	0.102

Table 2.140: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	1,20E-04	0,998	2	0,996	0,008	25,646	-0,278	25,367	0,480
2	2,36E-04	0,998	2	0,997	0,011	25,615	-0,440	25,175	0,316
3	9,45E-04	0,999	2	0,998	0,022	34,621	-1,078	33,543	0,158
4	1,46E-04	0,997	2	0,994	0,009	22,544	-0,260	22,284	0,491
5	1,51E-04	0,997	2	0,994	0,009	23,995	-0,259	23,736	0,579
6	2,12E-04	0,996	2	0,991	0,010	24,295	-0,254	24,041	0,580
7	1,08E-05	0,999	2	0,999	0,002	13,790	-0,163	13,627	0,493
8	1,33E-05	1,000	2	0,999	0,003	18,863	-0,188	18,675	0,591
9	6,90E-04	0,999	2	0,998	0,019	18,232	-1,076	17,155	0,100
10	1,32E-04	0,998	2	0,997	0,008	35,262	-0,326	34,936	0,392
11	1,23E-03	0,998	2	0,995	0,025	19,016	-0,863	18,153	0,133
12	9,44E-04	0,997	2	0,993	0,022	31,175	-0,641	30,534	0,188
13	1,11E-04	0,998	2	0,996	0,007	29,312	-0,288	29,024	0,489
14	2,43E-03	0,999	2	0,998	0,035	24,462	-1,732	22,729	0,102

Figure 2.160: Goodness of Fit and final values for step 50 to 40 %RH.

2.11 Step: 40 to 30 %RH

The obtained data for a step from 40 to 30 %RH:

Raw data

	Fri 21/1 13:00	Fri 21/1 15:15	Fri 21/1 17:30	Mon 24/1 08:45	
RH setpoint [%RH]	40	30	30	30	
RH measured [%RH]	40,4	30,5	30,5	30,5	
T measured [C]	21,7	21,7	21,7	21,7	
Time [h]	0,00	2,25	4,50	67,75	
Sample no.					FINAL DM/DT [g/h]
1	25,362	25,071	24,870	23,490	-0,022
2	25,169	24,859	24,655	23,249	-0,022
3	33,547	33,034	32,657	30,40	-0,036
4	22,277	21,996	21,800	20,326	-0,023
5	23,729	23,421	23,193	21,597	-0,025
6	24,033	23,709	23,475	21,807	-0,026
7	13,624	13,531	13,503	13,490	-0,000
8	18,672	18,549	18,525	18,509	-0,000
9	17,217	17,034	16,941	16,706	-0,004
10	34,933	34,653	34,473	32,88	-0,025
11	18,169	17,978	17,895	17,723	-0,003
12	30,531	30,161	29,901	27,95	-0,031
13	29,022	28,711	28,474	26,697	-0,028
14	22,818	22,353	22,048	20,627	-0,022
Empty	-0,023	-0,021	-0,021	-0,022	-0,000

Figure 2.161: Mass of samples for a step from 40 to 30 %RH.

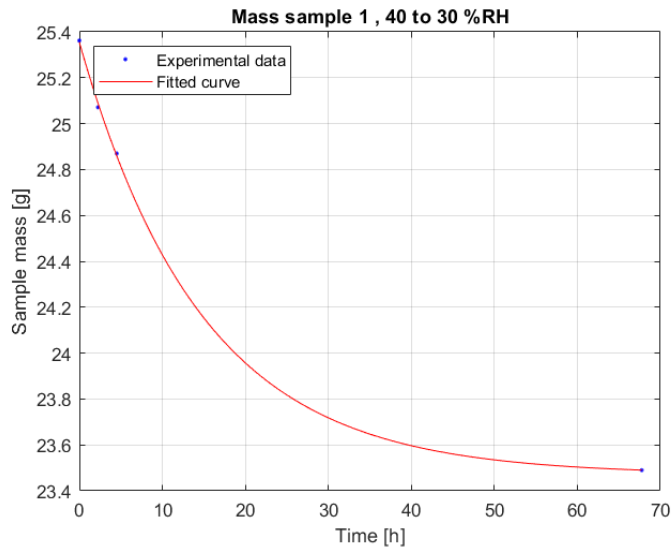
Sample 1:

Figure 2.162: fitted curve

SSE	4.61e-04
R-Square	1.000
DFE	1
Adjusted R-Square	0.999
RMSE	0.021
a	-1.884
c	25.355
End value	23.471
b	0.068

Table 2.141: Goodness of Fit

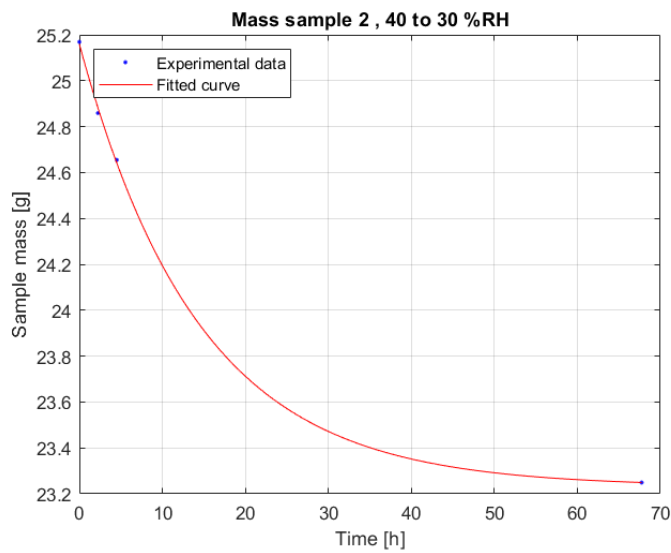
Sample 2:

Figure 2.163: fitted curve

SSE	7.24e-04
R-Square	1.000
DFE	1
Adjusted R-Square	0.999
RMSE	0.027
a	-1.928
c	25.160
End value	23.232
b	0.069

Table 2.142: Goodness of Fit

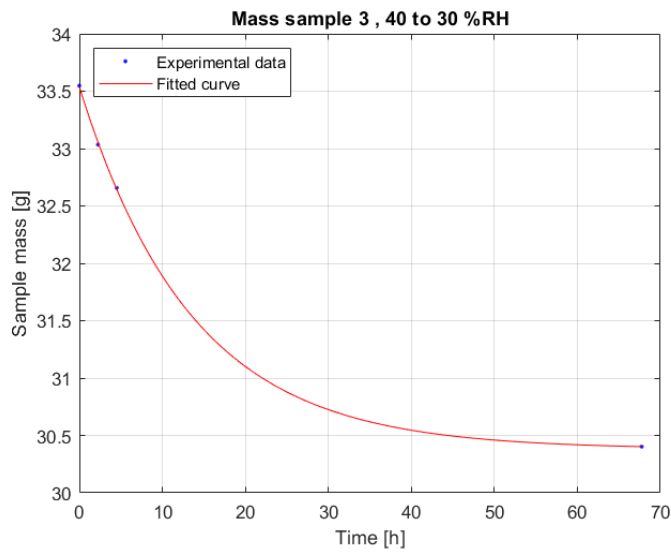
Sample 3:

Figure 2.164: fitted curve

SSE	6.44e-04
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.025
a	-3.157
c	33.538
End value	30.381
b	0.074

Table 2.143: Goodness of Fit

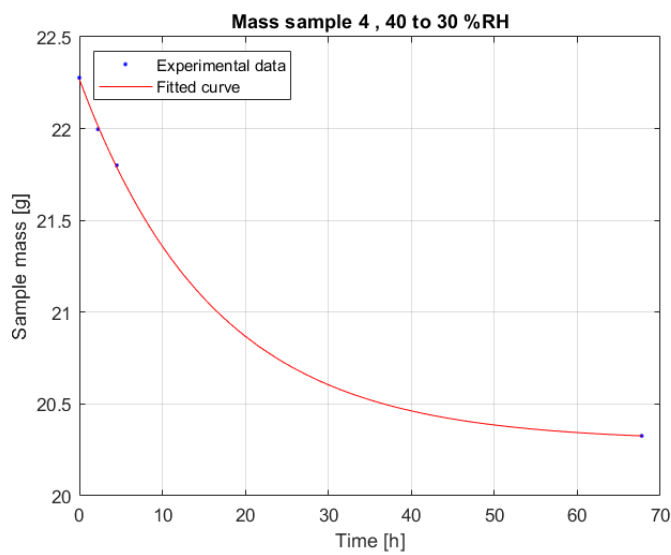
Sample 4:

Figure 2.165: fitted curve

SSE	4.48e-04
R-Square	1.000
DFE	1
Adjusted R-Square	0.999
RMSE	0.021
a	-1.973
c	22.270
End value	20.296
b	0.062

Table 2.144: Goodness of Fit

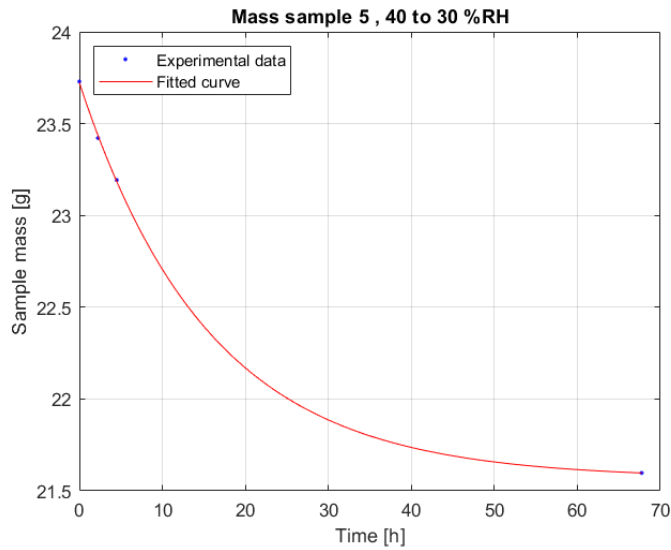
Sample 5:

Figure 2.166: fitted curve

SSE	2.88e-04
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.017
a	-2.154
c	23.723
End value	21.569
b	0.064

Table 2.145: Goodness of Fit

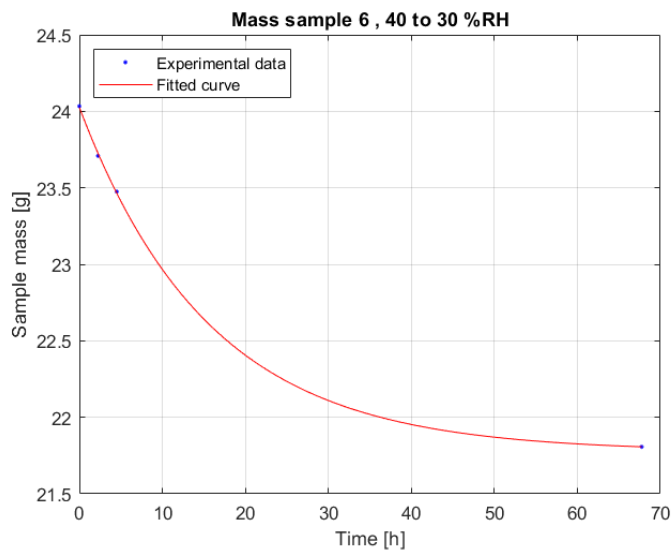
Sample 6:

Figure 2.167: fitted curve

SSE	4.18e-04
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.020
a	-2.249
c	24.026
End value	21.777
b	0.064

Table 2.146: Goodness of Fit

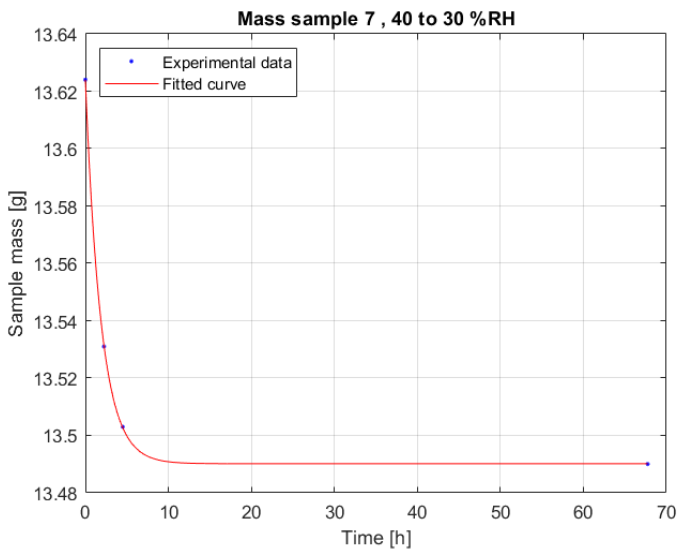
Sample 7:

Figure 2.168: fitted curve

SSE	1.28e-07
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.000
a	-0.134
c	13.624
End value	13.490
b	0.525

Table 2.147: Goodness of Fit

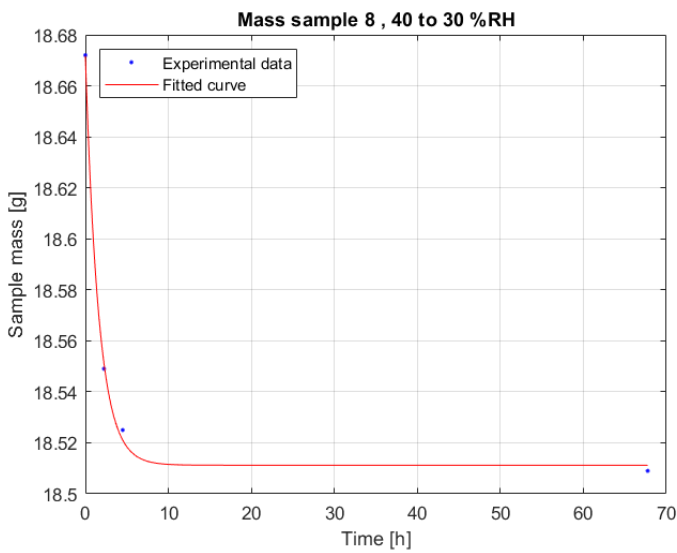
Sample 8:

Figure 2.169: fitted curve

SSE	2.44e-05
R-Square	0.999
DFE	1
Adjusted R-Square	0.996
RMSE	0.005
a	-0.161
c	18.672
End value	18.511
b	0.620

Table 2.148: Goodness of Fit

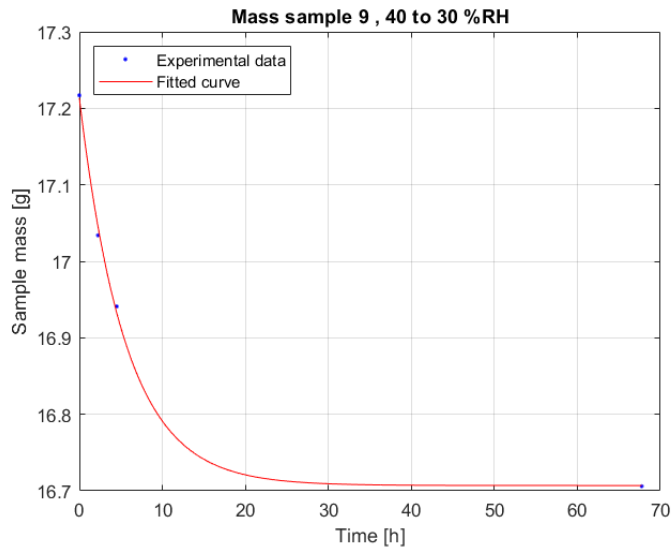
Sample 9:

Figure 2.170: fitted curve

SSE	2.05e-04
R-Square	0.998
DFE	1
Adjusted R-Square	0.995
RMSE	0.014
a	-0.506
c	17.213
End value	16.707
b	0.179

Table 2.149: Goodness of Fit

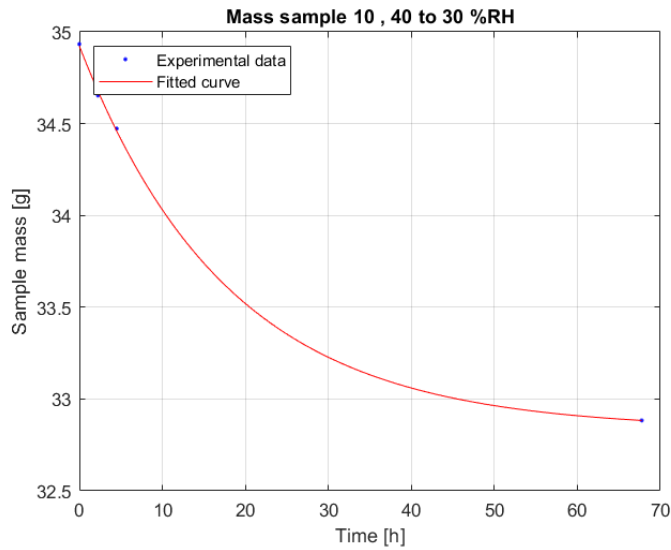
Sample 10:

Figure 2.171: fitted curve

SSE	8.45e-04
R-Square	1.000
DFE	1
Adjusted R-Square	0.999
RMSE	0.029
a	-2.087
c	34.923
End value	32.835
b	0.056

Table 2.150: Goodness of Fit

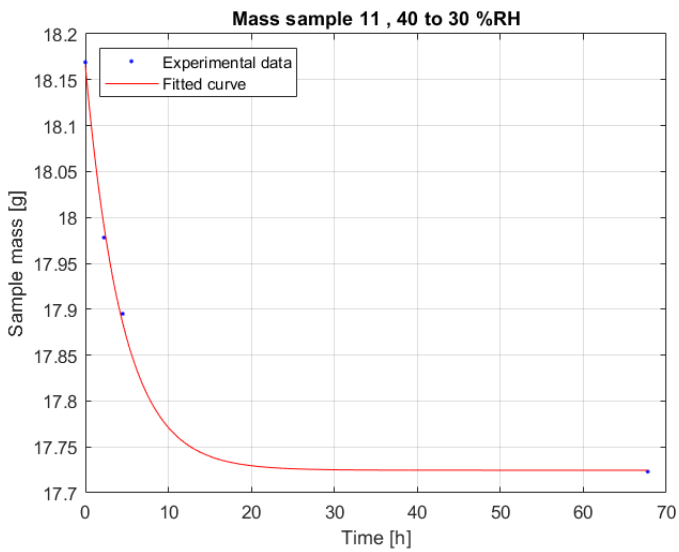
Sample 11:

Figure 2.172: fitted curve

SSE	2.72e-04
R-Square	0.997
DFE	1
Adjusted R-Square	0.992
RMSE	0.016
a	-0.441
c	18.165
End value	17.725
b	0.225

Table 2.151: Goodness of Fit

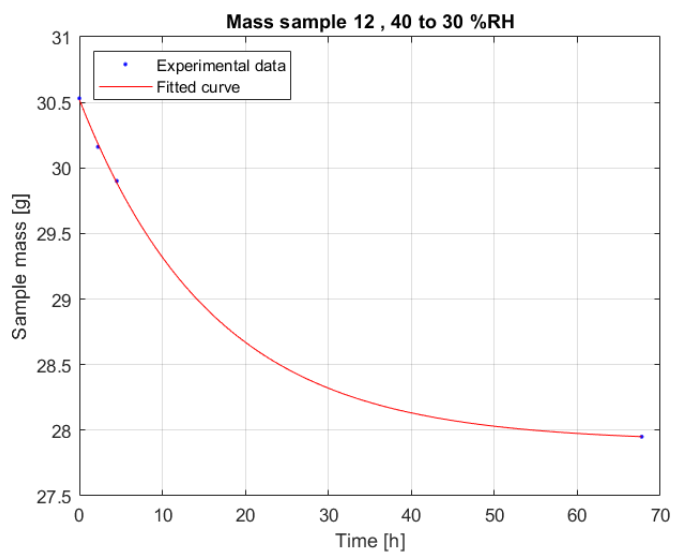
Sample 12:

Figure 2.173: fitted curve

SSE	7.33e-04
R-Square	1.000
DFE	1
Adjusted R-Square	0.999
RMSE	0.027
a	-2.610
c	30.521
End value	27.911
b	0.062

Table 2.152: Goodness of Fit

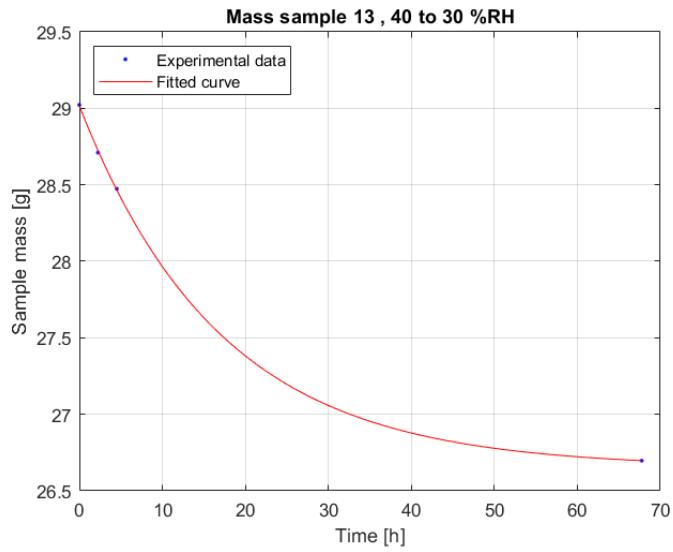
Sample 13:

Figure 2.174: fitted curve

SSE	2.38e-04
R-Square	1.000
DFE	1
Adjusted R-Square	1.000
RMSE	0.015
a	-2.363
c	29.017
End value	26.653
b	0.059

Table 2.153: Goodness of Fit

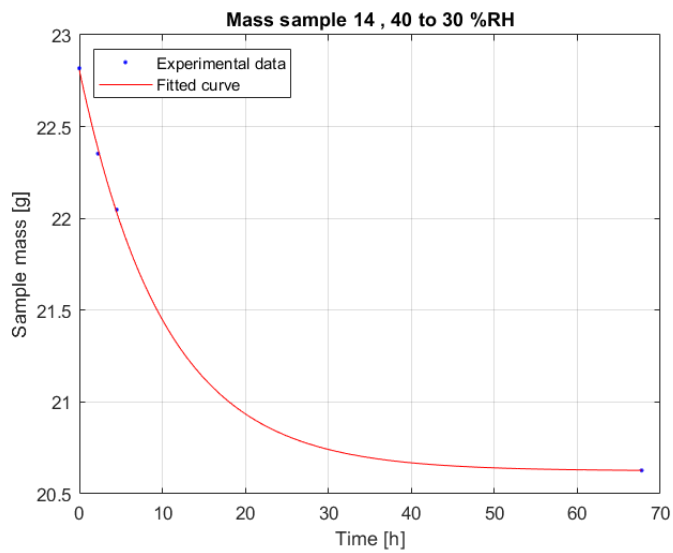
Sample 14:

Figure 2.175: fitted curve

SSE	9.60e-04
R-Square	1.000
DFE	1
Adjusted R-Square	0.999
RMSE	0.031
a	-2.183
c	22.808
End value	20.625
b	0.098

Table 2.154: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	f(∞)	b
1	4,61E-04	1,000	1	0,999	0,021	25,355	-1,884	23,471	0,068
2	7,24E-04	1,000	1	0,999	0,027	25,160	-1,928	23,232	0,069
3	6,44E-04	1,000	1	1,000	0,025	33,538	-3,157	30,381	0,074
4	4,48E-04	1,000	1	0,999	0,021	22,270	-1,973	20,296	0,062
5	2,88E-04	1,000	1	1,000	0,017	23,723	-2,154	21,569	0,064
6	4,18E-04	1,000	1	1,000	0,020	24,026	-2,249	21,777	0,064
7	1,28E-07	1,000	1	1,000	0,000	13,624	-0,134	13,490	0,525
8	2,44E-05	0,999	1	0,996	0,005	18,672	-0,161	18,511	0,620
9	2,05E-04	0,998	1	0,995	0,014	17,213	-0,506	16,707	0,179
10	8,45E-04	1,000	1	0,999	0,029	34,923	-2,087	32,835	0,056
11	2,72E-04	0,997	1	0,992	0,016	18,165	-0,441	17,725	0,225
12	7,33E-04	1,000	1	0,999	0,027	30,521	-2,610	27,911	0,062
13	2,38E-04	1,000	1	1,000	0,015	29,017	-2,363	26,653	0,059
14	9,60E-04	1,000	1	0,999	0,031	22,808	-2,183	20,625	0,098

Figure 2.176: Goodness of Fit and final values for step 40 to 30 %RH.

2.12 Step: 30 to 20 %RH

The obtained data for a step from 30 to 20 %RH:

Raw data

	Mon 24/1 09:00	Mon 24/1 11:30	Mon 24/1 14:30	Mon 24/1 17:15	Tue 25/1 08:45	Tue 25/1 12:45	Tue 25/1 15:30	
RH setpoint [%RH]	30	20	20	20	20	20	20	
RH measured [%RH]	30,5	20,6	20,6	20,7	20,7	20,7	20,7	
T measured [C]	21,7	21,7	21,7	21,7	21,7	21,7	21,7	
Time [h]	0,00	2,50	5,50	8,25	23,75	27,75	30,50	
Sample no.								
								FINAL DM/DT [g/h]
1	23,490	23,141	22,897	22,745	22,408	22,380	22,362	-0,003
2	23,249	22,887	22,650	22,496	22,124	22,085	22,060	-0,004
3	30,402	29,926	29,643	29,468	29,032	28,978	28,957	-0,003
4	20,326	20,014	19,804	19,669	19,339	19,307	19,292	-0,002
5	21,597	21,253	21,027	20,882	20,554	20,525	20,513	-0,002
6	21,807	21,442	21,208	21,059	20,757	20,733	20,725	-0,001
7	13,490	13,398	13,376	13,372	13,367	13,366	13,368	+0,000
8	18,509	18,396	18,366	18,364	18,360	18,361	18,363	+0,000
9	16,706	16,566	16,499	16,456	16,417	16,412	16,411	-0,000
10	32,883	32,495	32,221	31,928	31,344	31,269	31,232	-0,005
11	17,723	17,572	17,510	17,472	17,433	17,431	17,432	+0,000
12	27,951	27,531	27,271	26,991	26,519	26,468	26,445	-0,003
13	26,697	26,272	25,944	25,644	25,100	25,027	24,995	-0,005
14	20,627	20,363	20,212	20,109	19,927	19,916	19,908	-0,001
Empty	-0,022	-0,018	-0,021	-0,018	-0,021	-0,022	-0,021	+0,001

Figure 2.177: Mass of samples for a step from 30 to 20 %RH.

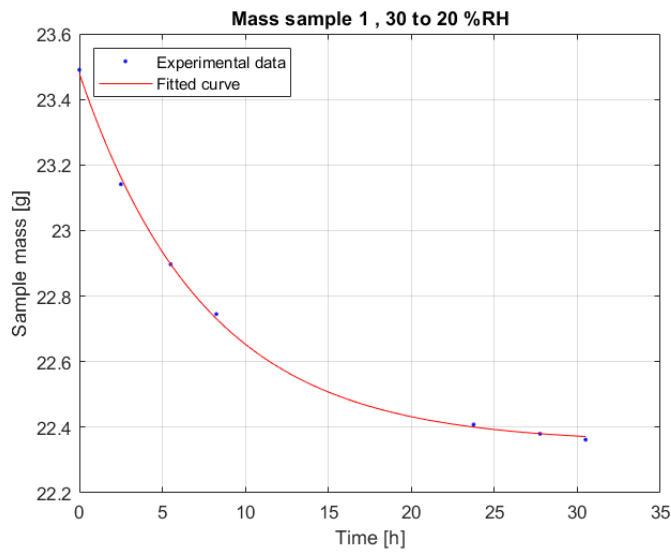
Sample 1:

Figure 2.178: fitted curve

SSE	9.10e-04
R-Square	0.999
DFE	4
Adjusted R-Square	0.999
RMSE	0.015
a	-1.128
c	23.479
End value	22.351
b	0.132

Table 2.155: Goodness of Fit

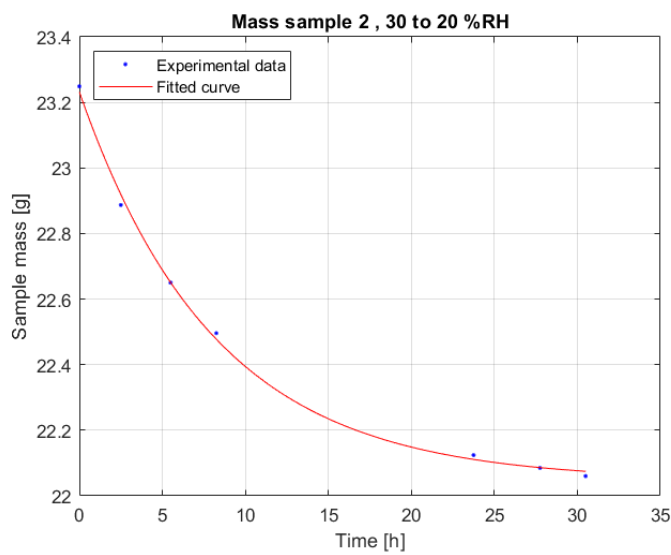
Sample 2:

Figure 2.179: fitted curve

SSE	2.04e-03
R-Square	0.998
DFE	4
Adjusted R-Square	0.998
RMSE	0.023
a	-1.186
c	23.232
End value	22.047
b	0.123

Table 2.156: Goodness of Fit

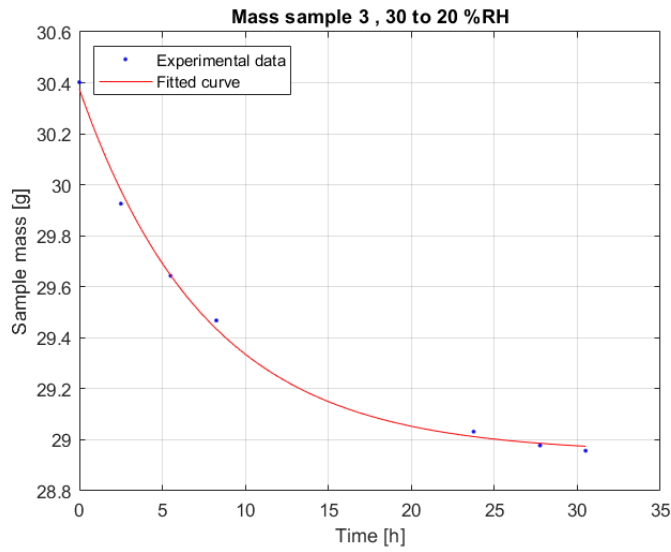
Sample 3:

Figure 2.180: fitted curve

SSE	5.31e-03
R-Square	0.997
DFE	4
Adjusted R-Square	0.996
RMSE	0.036
a	-1.427
c	30.375
End value	28.948
b	0.130

Table 2.157: Goodness of Fit

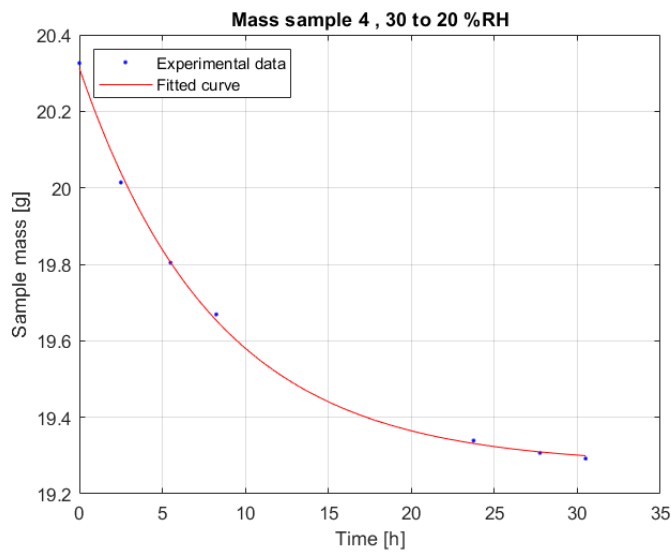
Sample 4:

Figure 2.181: fitted curve

SSE	1.19e-03
R-Square	0.999
DFE	4
Adjusted R-Square	0.998
RMSE	0.017
a	-1.038
c	20.313
End value	19.275
b	0.122

Table 2.158: Goodness of Fit

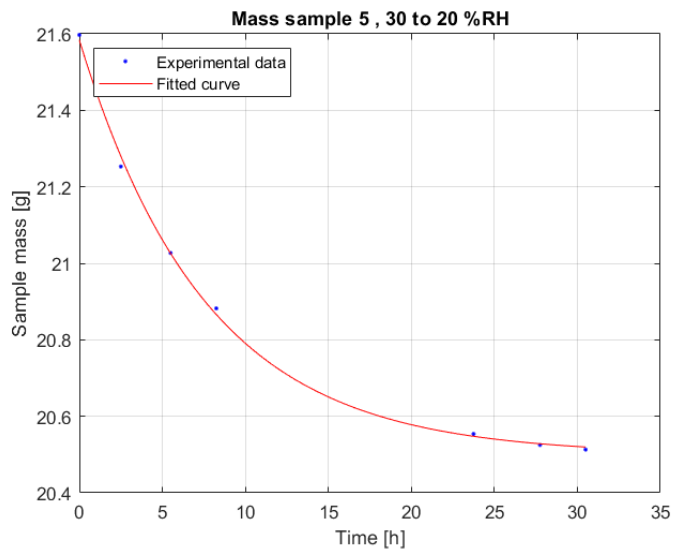
Sample 5:

Figure 2.182: fitted curve

SSE	1.25e-03
R-Square	0.999
DFE	4
Adjusted R-Square	0.998
RMSE	0.018
a	-1.084
c	21.584
End value	20.500
b	0.132

Table 2.159: Goodness of Fit

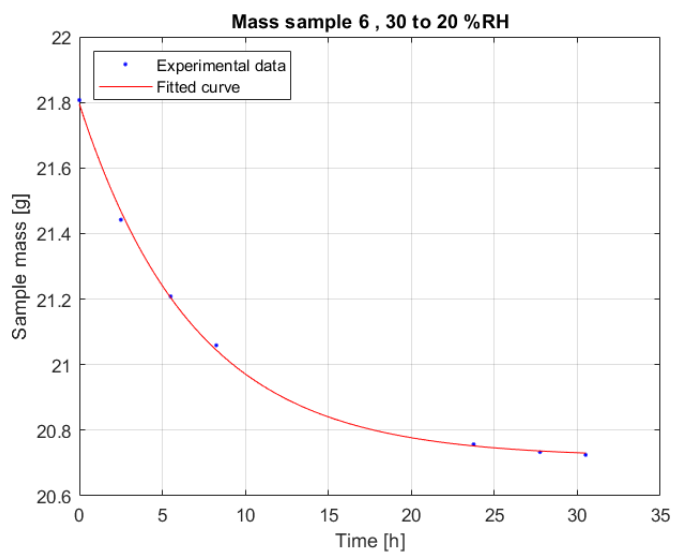
Sample 6:

Figure 2.183: fitted curve

SSE	1.13e-03
R-Square	0.999
DFE	4
Adjusted R-Square	0.998
RMSE	0.017
a	-1.078
c	21.795
End value	20.717
b	0.144

Table 2.160: Goodness of Fit

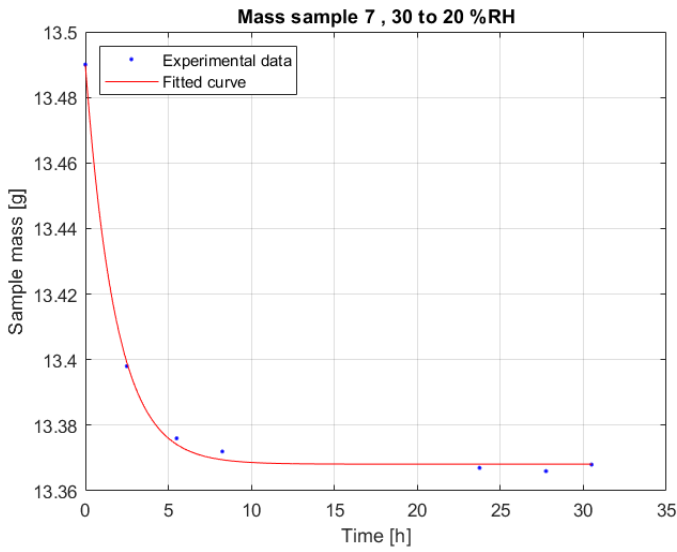
Sample 7:

Figure 2.184: fitted curve

SSE	1.70e-05
R-Square	0.999
DFE	4
Adjusted R-Square	0.998
RMSE	0.002
a	-0.122
c	13.490
End value	13.368
b	0.547

Table 2.161: Goodness of Fit

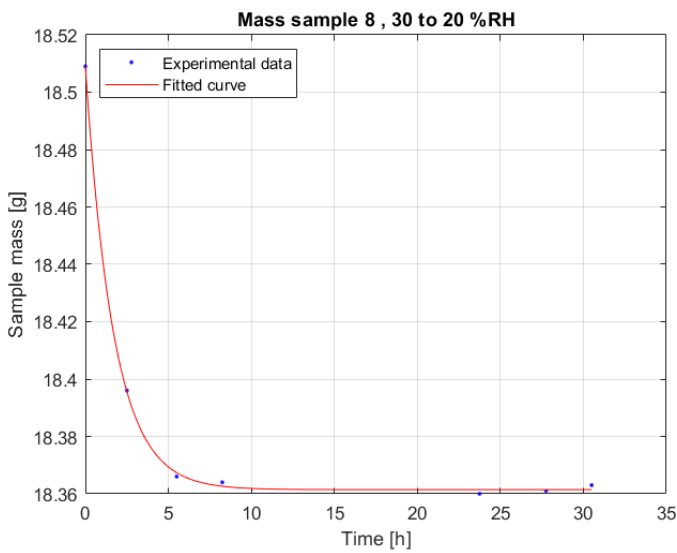
Sample 8:

Figure 2.185: fitted curve

SSE	8.56e-06
R-Square	1.000
DFE	4
Adjusted R-Square	0.999
RMSE	0.001
a	-0.148
c	18.509
End value	18.361
b	0.585

Table 2.162: Goodness of Fit

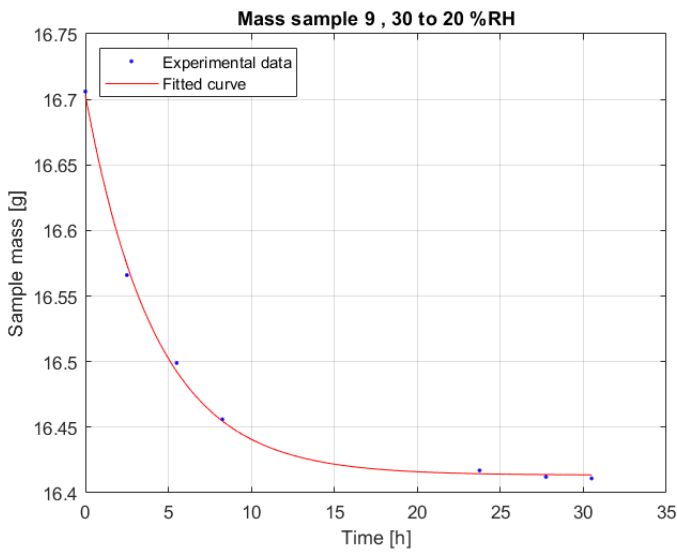
Sample 9:

Figure 2.186: fitted curve

SSE	1.32e-04
R-Square	0.998
DFE	4
Adjusted R-Square	0.997
RMSE	0.006
a	-0.290
c	16.703
End value	16.413
b	0.236

Table 2.163: Goodness of Fit

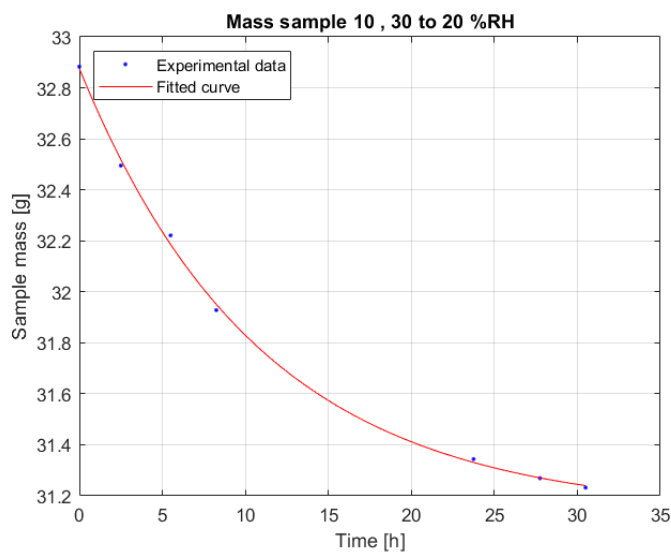
Sample 10:

Figure 2.187: fitted curve

SSE	2.64e-03
R-Square	0.999
DFE	4
Adjusted R-Square	0.998
RMSE	0.026
a	-1.742
c	32.876
End value	31.134
b	0.092

Table 2.164: Goodness of Fit

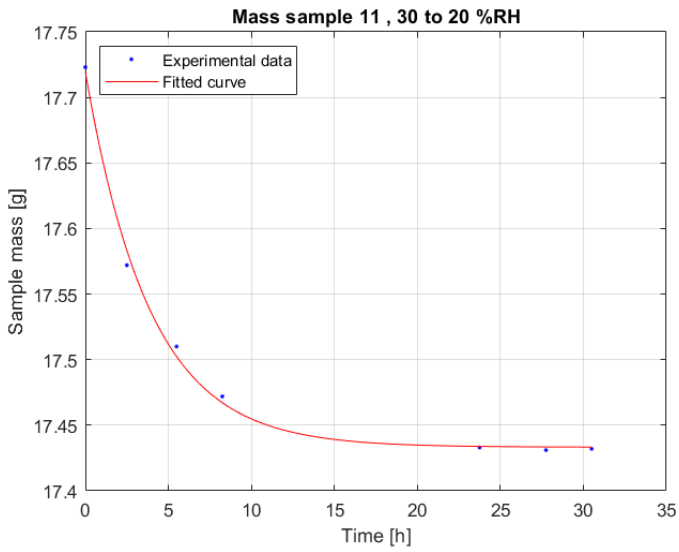
Sample 11:

Figure 2.188: fitted curve

SSE	2.30e-04
R-Square	0.997
DFE	4
Adjusted R-Square	0.995
RMSE	0.008
a	-0.286
c	17.720
End value	17.433
b	0.258

Table 2.165: Goodness of Fit

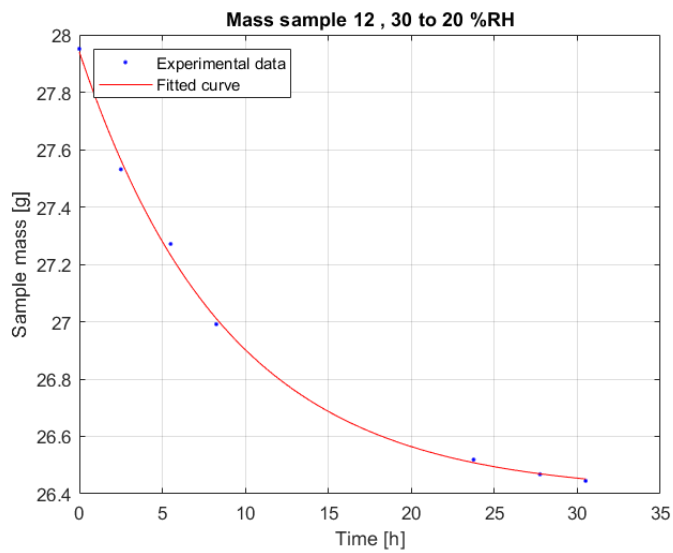
Sample 12:

Figure 2.189: fitted curve

SSE	3.31e-03
R-Square	0.998
DFE	4
Adjusted R-Square	0.998
RMSE	0.029
a	-1.539
c	27.940
End value	26.402
b	0.112

Table 2.166: Goodness of Fit

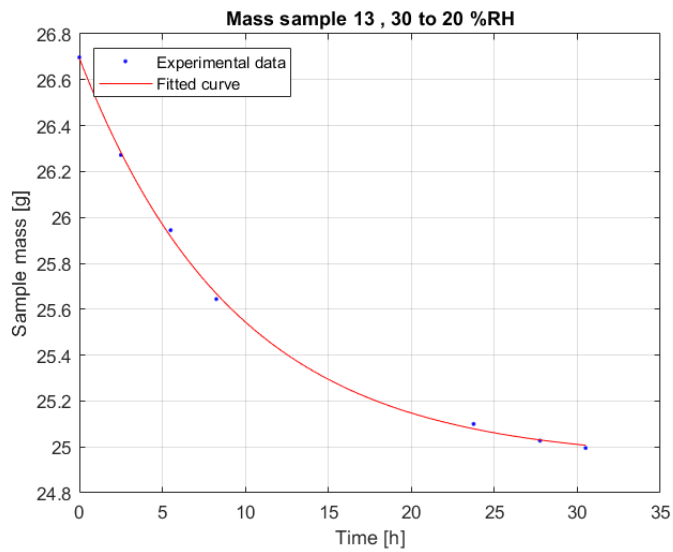
Sample 13:

Figure 2.190: fitted curve

SSE	2.11e-03
R-Square	0.999
DFE	4
Adjusted R-Square	0.999
RMSE	0.023
a	-1.755
c	26.694
End value	24.939
b	0.106

Table 2.167: Goodness of Fit

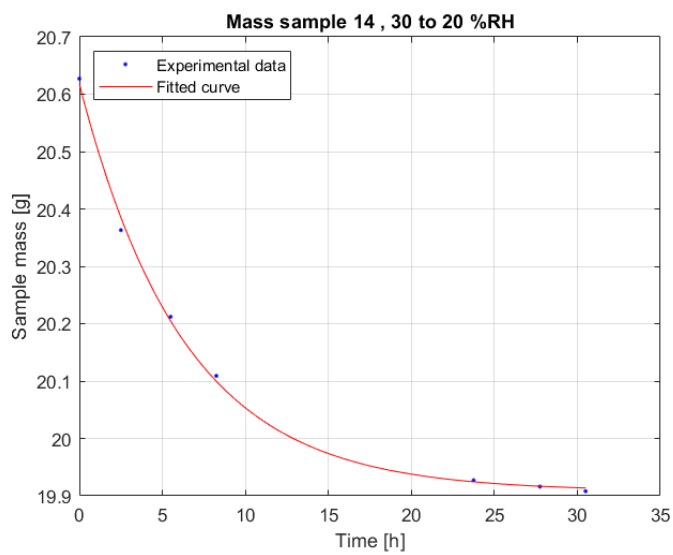
Sample 14:

Figure 2.191: fitted curve

SSE	7.66e-04
R-Square	0.998
DFE	4
Adjusted R-Square	0.997
RMSE	0.014
a	-0.710
c	20.618
End value	19.908
b	0.159

Table 2.168: Goodness of Fit

Fit results and final values

Sample no.	SSE	R-Square	DFE	Adj. R-Square	RMSE	c	a	$f(\infty)$	b
1	9,10E-04	0,999	4	0,999	0,015	23,479	-1,128	22,351	0,132
2	2,04E-03	0,998	4	0,998	0,023	23,232	-1,186	22,047	0,123
3	5,31E-03	0,997	4	0,996	0,036	30,375	-1,427	28,948	0,130
4	1,19E-03	0,999	4	0,998	0,017	20,313	-1,038	19,275	0,122
5	1,25E-03	0,999	4	0,998	0,018	21,584	-1,084	20,500	0,132
6	1,13E-03	0,999	4	0,998	0,017	21,795	-1,078	20,717	0,144
7	1,70E-05	0,999	4	0,998	0,002	13,490	-0,122	13,368	0,547
8	8,56E-06	1,000	4	0,999	0,001	18,509	-0,148	18,361	0,585
9	1,32E-04	0,998	4	0,997	0,006	16,703	-0,290	16,413	0,236
10	2,64E-03	0,999	4	0,998	0,026	32,876	-1,742	31,134	0,092
11	2,30E-04	0,997	4	0,995	0,008	17,720	-0,286	17,433	0,258
12	3,31E-03	0,998	4	0,998	0,029	27,940	-1,539	26,402	0,112
13	2,11E-03	0,999	4	0,999	0,023	26,694	-1,755	24,939	0,106
14	7,66E-04	0,998	4	0,997	0,014	20,618	-0,710	19,908	0,159

Figure 2.192: Goodness of Fit and final values for step 30 to 20 %RH.