

SUPPORTING INFORMATION

– CHAPTER 4

MINERAL INTERACTIONS

**Dissertation zur Erlangung des
akademischen Grades eines Doktors der Naturwissenschaften
(Dr. rer. nat.)**

vorgelegt von

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1 HAP dissolution experiments

1.1 AAS measurements

Table S1. AAS measurements of calcium (from Hydroxyapatite) absorbed **I** polymers using the calibration curve $f(x) = 0.05897x - 0.00258$.

Sample	Absorbance	Total calcium [ppm]	calcium after dilution * [$\mu\text{mol/mL}$]	c(COO ⁻) [$\mu\text{mol/mL}$]	Ca/COO- [%]	Ca/Polymer [wt%]
I1-1	0.204	3.503	0.073	0.86		
I1-2	0.214	3.673	0.077	0.86	8.56	0.71
I1-3	0.199	3.418	0.071	0.86		
I2-1	0.221	3.791	0.175	1.60		
I2-2	0.207	3.554	0.163	1.60	10.67	1.48
I2-3	0.22	3.774	0.174	1.60		
I3-1	0.149	2.570	0.114	0.68		
I3-2	0.142	2.452	0.108	0.68	16.26	1.00
I3-3	0.289	4.945	0.109	0.68		
I4-1	0.235	4.029	0.186	1.51		
I4-2	0.244	4.181	0.194	1.51	12.49	1.63
I4-3	0.233	3.995	0.185	1.51		
I5-1	0.305	5.216	0.246	1.76		
I5-2	0.344	5.877	0.279	1.76	14.89	2.37
I5-3	0.217	3.724	0.264	1.76		
I6-1	0.079	1.383	0.089	0.56 **		
I6-2	0.129	2.231	0.152	0.56 **	23.32	1.17
I6-3	0.13	2.248	0.154	0.56 **		
I8-1	0.061	1.078	0.066	2.45 **		
I8-2	0.092	1.604	0.105	2.45 **	3.75	0.85
I8-3	0.091	1.587	0.104	2.45 **		
REF1	0.046	0.824	0.021	-	-	-
REF2	0.022	0.417	0.010	-	-	-
REF3	0.028	0.519	0.013	-	-	-

* representing the calcium content minus the reference of 0.015 $\mu\text{mol/mL}$

** Since the polymers contain positively charged lysine segments, those numbers represent the amount of calcium ions per lysine group for the sake of comparability.

Table S2. AAS measurements of calcium (from Hydroxyapatite) absorbed **A** polymers using the calibration curve $f(x) = 0.02841x + 0.080845$ and the presence of lanthan(III)chloride to mask the phosphates as described elsewhere.¹

Sample	Absorbance	Total calcium [ppm]	calcium after dilution * [$\mu\text{mol/mL}$]	c(COO ⁻) [$\mu\text{mol/mL}$]	Ca/COO- [%]	Ca/Polymer [wt%]
A2-1	0.144	2.222985	0.222	0.6238		
A2-2	0.126	1.589405	0.159	0.6635	25.37	1.40
A2-3	0.121	1.413411	0.141	0.6352		
A3-1	0.143	2.187786	0.219	0.5086		
A3-2	0.119	1.343013	0.134	0.4929	29.55	1.45
A3-3	0.141	2.117388	0.212	0.5336		
REF1	0.019	0.392593	0.010	-	-	-
REF2	0.016	0.303704	0.008	-	-	-

* representing the calcium content minus the reference of 0.015 $\mu\text{mol/mL}$

Table S3. AAS measurements of calcium (from Hydroxyapatite) absorbed **J** polymers using the calibration curve $f(x) = 0.05897x - 0.00258$.

Sample	Absorbance	Total calcium [ppm]	calcium after dilution * [$\mu\text{mol/mL}$]	c(COO ⁻) [$\mu\text{mol/mL}$]	Ca/COO- [%]	Ca/Polymer [wt%]
J1-1	0.298	5.097	0.113	0.94		
J1-2	0.259	4.436	0.096	0.94	11.28	0.97
J1-3	0.292	4.995	0.110	0.94		
J2-1	0.283	4.843	0.106	1.67		
J2-2	0.25	4.283	0.092	1.67	5.84	0.90
J2-3	0.253	4.334	0.094	1.67		
J3-1	0.212	3.639	0.167	1.80		
J3-2	0.196	3.367	0.153	1.80	8.94	1.41
J3-3	0.208	3.571	0.164	1.80		
J5-1	0.352	6.013	0.135	1.16		
J5-2	0.271	4.639	0.101	1.16	10.00	1.05
J5-3	0.296	5.063	0.112	1.16		
J7-1	0.189	3.249	0.066	0.58		
J7-2	0.159	2.740	0.054	0.58	10.48	0.60
J7-3	0.176	3.028	0.061	0.58		
J8-1	0.283	4.843	0.227	0.28		
J8-2	0.27	4.622	0.216	0.28	83.35	1.99
J8-3	0.32	5.470	0.258	0.28		
J9-1	0.211	3.622	0.076	0.75		
J9-2	0.275	4.707	0.103	0.75	12.54	0.87
J9-3	0.278	4.758	0.104	0.75		
J10-1	0.212	3.639	0.167	1.80		
J10-2	0.196	3.367	0.153	1.80	8.94	1.41
J10-3	0.208	3.571	0.164	1.80		
J11-1	0.28	4.792	0.105	0.64		
J11-2	0.179	3.079	0.062	0.64	12.92	0.78
J11-3	0.22	3.774	0.080	0.64		
REF1	0.046	0.824	0.021	-	-	-
REF2	0.022	0.417	0.010	-	-	-
REF3	0.028	0.519	0.013	-	-	-

* representing the calcium content minus the reference of 0.015 $\mu\text{mol/mL}$

2 Inhibition of Hydroxyapatite nucleation

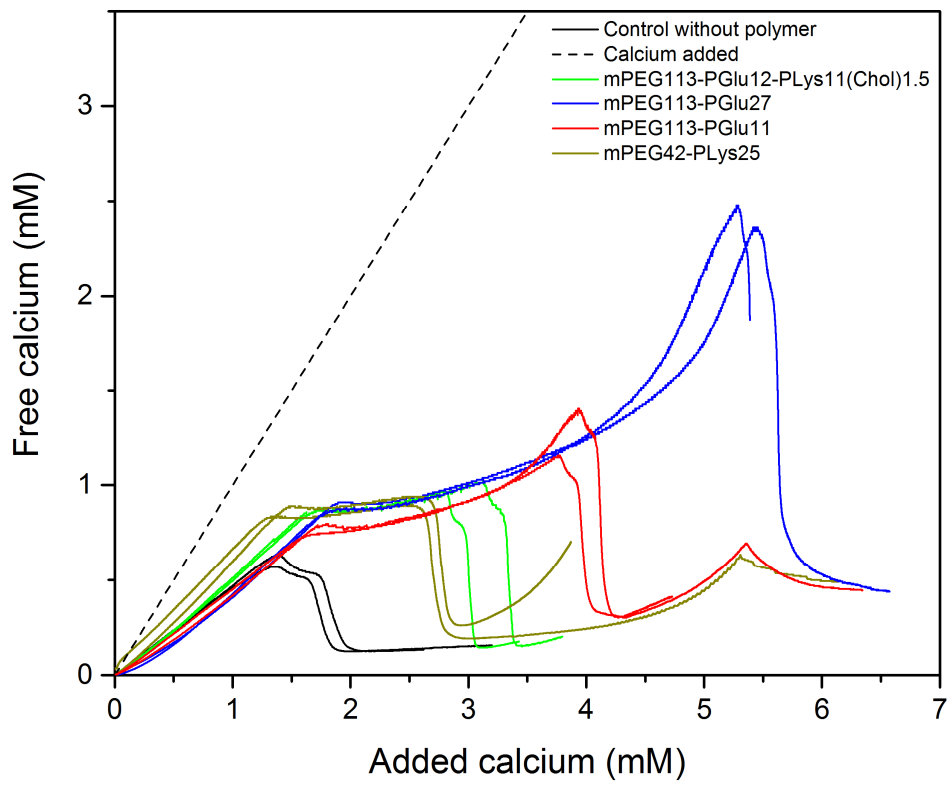


Figure S1. Results of the pH-constant titration assays showing the influence of all polymer structures tested.

3 References

1. Keckeis, P., Drabinová, E., Ruiz-Agudo, C., Avaro, J., Glatt, L., Sedlák, M. & Cölfen, H. Multifunctional Block Copolymers for Simultaneous Solubilization of Poorly Water-Soluble Cholesterol and Hydroxyapatite Crystals. *Advanced Functional Materials*, 1808331 (2019).