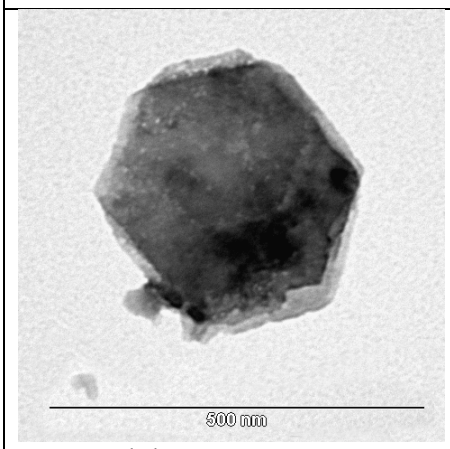
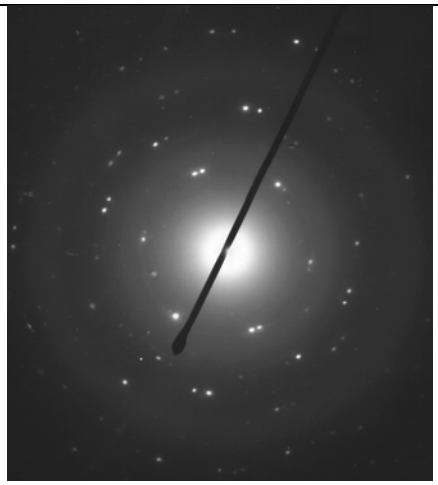
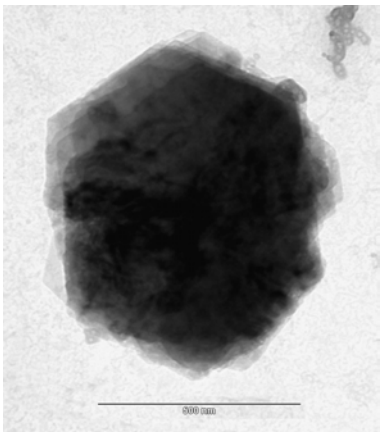
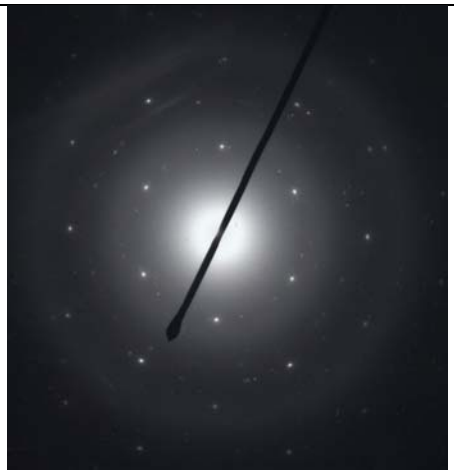
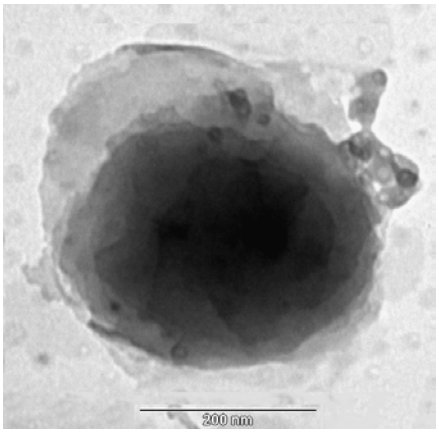
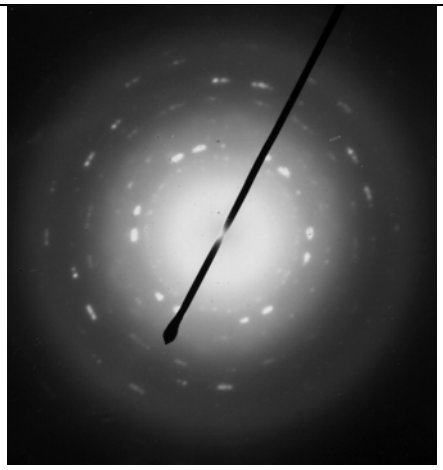
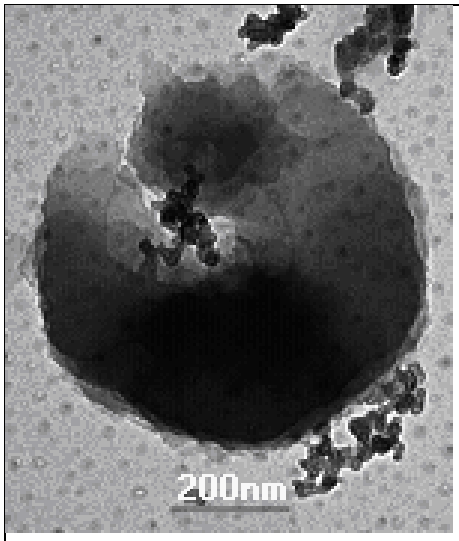
Diffraction patterns for these plate stacks gave double spots, sometimes faint rings too

TEM image	Electron diffraction pattern	D spacings and associated miller indices	
 1-46-2 5h b two lamellae	 Angular deviation btn spots = 8°	A. 2.538 & 2.548 & 2.540	(110/1$\underline{2}$0/$\underline{2}$10)
		E. 1.468 F. 1.453	(215) 1.472 (300) 1.440
		G. 1.270	(306) 1.284
		H. 1.654 I. 1.661	(210) 1.630 & 120
 1-47-1 3h c; three lamellae		A. 2.504 B. 2.548 C. 2.543	(110/1$\underline{2}$0/$\underline{2}$10)
		D. 1.481	(215)/(300)
		1. 1.258 2. 1.274 3. 1.278	(220)
 2-19-1 1h c (2733) two/three? Ill-defined lamellae	 Angular deviation: Between spots = 16° Of arc = 8°	1. 2.197	-
		2. 2.496	(110/1$\underline{2}$0/$\underline{2}$10)
		3. 2.114	(107) 2.117
		4. 1.670/ 1.649	-
		5. 1.629 & 1.662	(210) 1.633 & (120) 1.633
		6. 1.444	(300) 1.440
		7. 1.459	-
		8. 1.464	-

 2-19-1 1h f	 Angular deviation btn spots = 13.5° (in inner ring)	1. 2.831	(006)
		2. 2.470 & 2.509 & 2.521	(110/1$\underline{2}$0/$\underline{2}$10)
		3. 2.160	(200/2$\underline{2}$0/020)
		4. 1.590	(212) 1.604
		5. 1.435	(301) 1.435

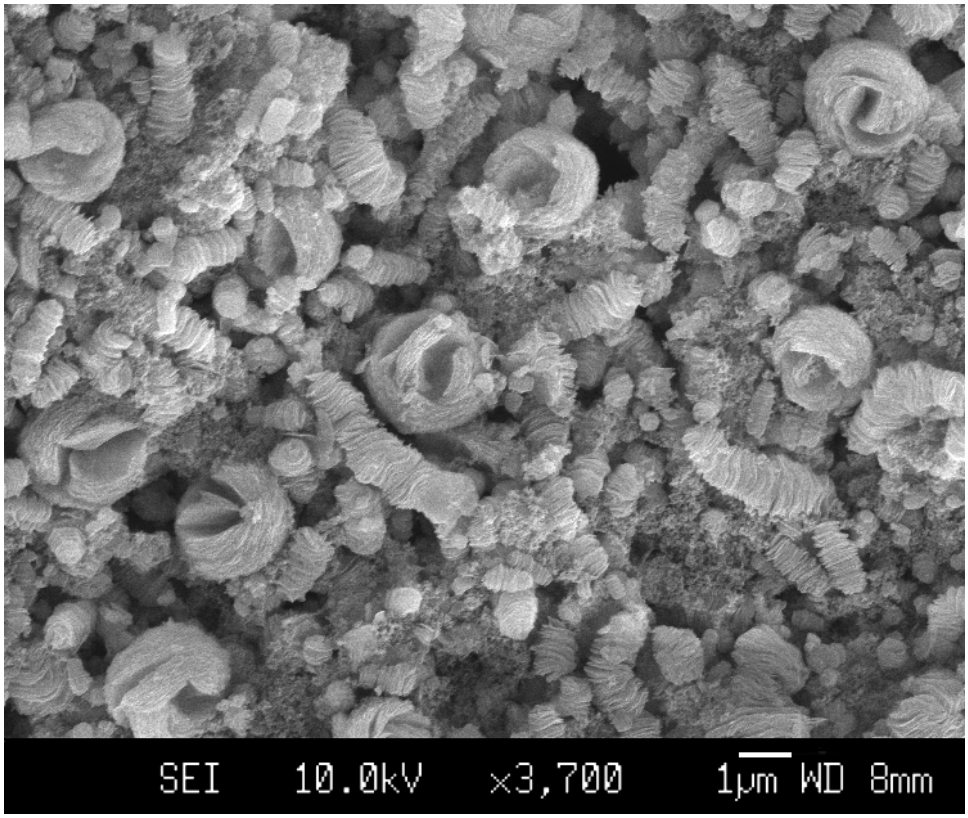


Fig. 4

SEM image of stacked lamellar structures of calcite and ring structures of aragonite, formed at $w = 20$

Experimental methods

† Carbonate-containing water-in-oil microemulsions were produced at $w = 40$ and pH = 11.8 by adding an appropriate amount of distilled water to microemulsion dispersions prepared at $w = 20$. The latter were typically prepared by addition of 72 μL of aqueous Na_2CO_3 (1 M**)** to 2 mL of a NaAOT/isooctane solution (0.1 M) followed by sonication in a water bath for 3 min. A dispersion of calcium-containing reverse micelles was prepared by dissolving dry calcium dodecylbenzenesulfonate in toluene (0.05 M) in the presence of *n*-butanol as a co-surfactant (surfactant : co-

surfactant molar ratio = 1 : 1). Coprecipitation was induced by adding 2 mL of the carbonate-containing microemulsion to 2 mL of the reverse micelle solution to give a pH of 11 and $[Ca^{2+}]$: $[CO_3^{2-}]$ molar ratio of 1.4 : 1, followed by auto-vortexing for 10 s, after which the mixture was left to stand at room temperature for up to 2 weeks. Assuming homogeneous water exchange, the *w* value after mixing was calculated as ≈ 25.

Samples were collected for electron microscopy, XRD and spectroscopic analysis between 30 min and 2 weeks after mixing of the reagents. Excess surfactants were removed by washing and centrifugation with ethanol, followed by at least three washings with a 1 : 1 mixture of aqueous NaCl (0.1 M) and ethanol.