

Supplementary information

Nanostructured individual nacre tablet: A subtle designed organic-inorganic composite

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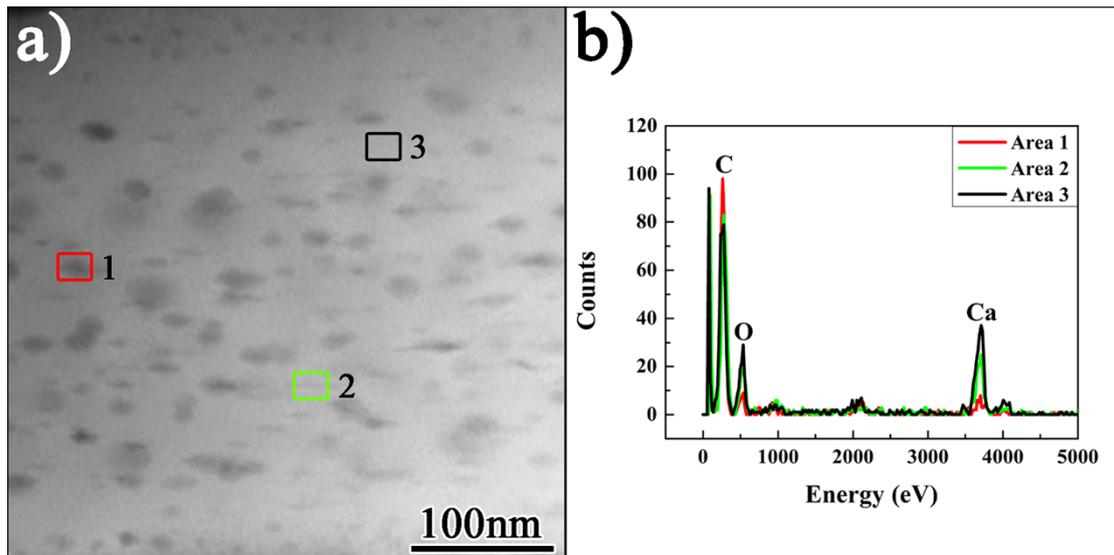


Figure. S1. (a) HAADF-STEM image of the individual nacre tablet in cross-section. Rectangles indicate the areas selected for EDX measurement. An islet-like defect and sheet-like defect can be found in area 1 and 2, respectively. While, there is no defect in area 3. (b) EDX spectra from the areas labelled in (a). The ratio between the carbon and the calcium peaks for area 1 and area 2 is $C/Ca=10.89$ and $C/Ca=3.19$, respectively, while this ratio for area 3 is $C/Ca=2.08$, implying that the islet-like and sheet-like defects contain an increased amount of carbon in comparison to the aragonite scaffold.

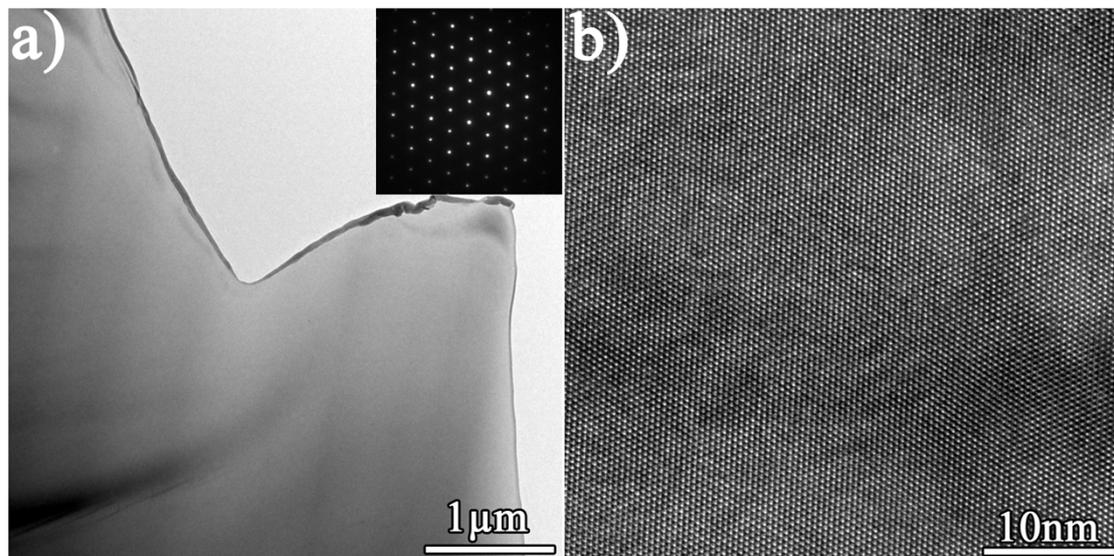


Figure. S2. (a) Bright field image of the geological aragonite. The SAED pattern inset exhibits characteristics of single crystal. (b) HRTEM image of the geological aragonite, showing the continuous aragonite lattice sequences.

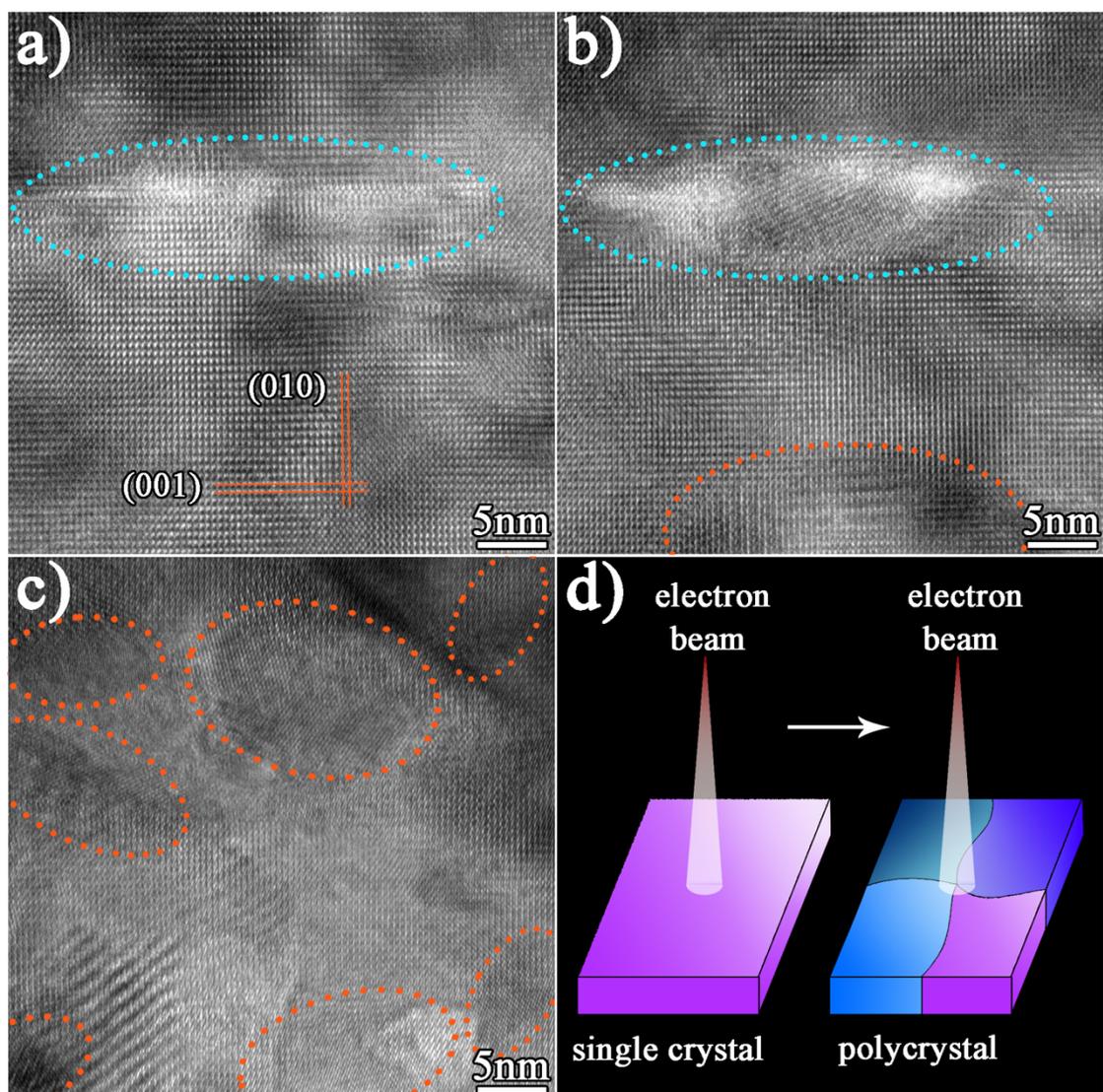


Figure. S3. (a) Original HRTEM image of the tablet, showing continuous and homodromous lattice sequences. The dashed blue oval indicates the position of a sheet-like organics. (b) In situ HRTEM image after electron irradiation for 8s. The areas indicated with dashed ovals show the tendency to transform. (c) In situ HRTEM image after electron irradiation for 30s, showing obvious characteristics of polycrystal. The nanocrystals in different orientations (indicated with dashed orange ovals) can be identified clearly. (d) Diagram of the transformation process, showing the effects of electron beam on single-crystal properties of the individual nacre tablet.

Table. S1. The electron optical parameter change in different TEM operation modes.

	Selected Mode		Normal Mode	
	3	3	1	1
Spot size	3.1	2.87	11.7	12.2
Screen current (nA)	1.57	1340	5.99	4850
Dose (e/Å ² S)	No. 2	No. 2	No. 3	No. 3
Condenser diaphragm				
Magnification	13.5 k	400 k	13.5 k	400 k