

Electronic Supplementary Information

For

**Bio-templated germanium photonic crystals by a facile liquid
phase deposition process**

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1. Experiments and materials characterization

Powder X-ray diffraction (XRD) measurements were carried out with a Bruker-AXS X-ray diffractometer system operating at a voltage of 35 kV with Cu K α radiation ($\lambda = 0.15406$ nm). The investigations of the morphologies and microstructures of the samples were carried out using an FEI Sirion 200 field-emission scanning electron microscope with a voltage of 20 kV. Transmission electron microscopy (TEM) and selected area electron diffraction (SEAM) images were measured using a JEOL JEM-2100F transmission electron microscope. The reflectance spectra of all the samples were obtained from an Olympus BX43 microscope coupled with NOVA spectrometer and ARM analyzer device bought from Shanghai Ideaoptics Corporation, in which the size of optical source is about several micro-meters in reflectance measure and dozens of micro-meters in multi-angle reflectance measure.

Table S1. Experimental conditions for exploring the influence of solid content, acid, pH value and immersing duration.

No.	Solid Content (%)	Acid	pH	Duration
1	2	H ₃ PO ₄	2	5
2	2	HCl	3	8
3	2	HAc	5	12
4	3	H ₃ PO ₄	5	8
5	3	HCl	2	12
6	3	HAc	3	5
7	5	H ₃ PO ₄	3	12
8	5	HCl	5	5
9	5	HAc	2	8

Table S2. Experiments to further study pH and durations.

No.	a	b	c	d	e	f
pH	4.8	5.0	5.2	5.2	5.2	5.2
Duration	8 h	8 h	8 h	6 h	8 h	10 h

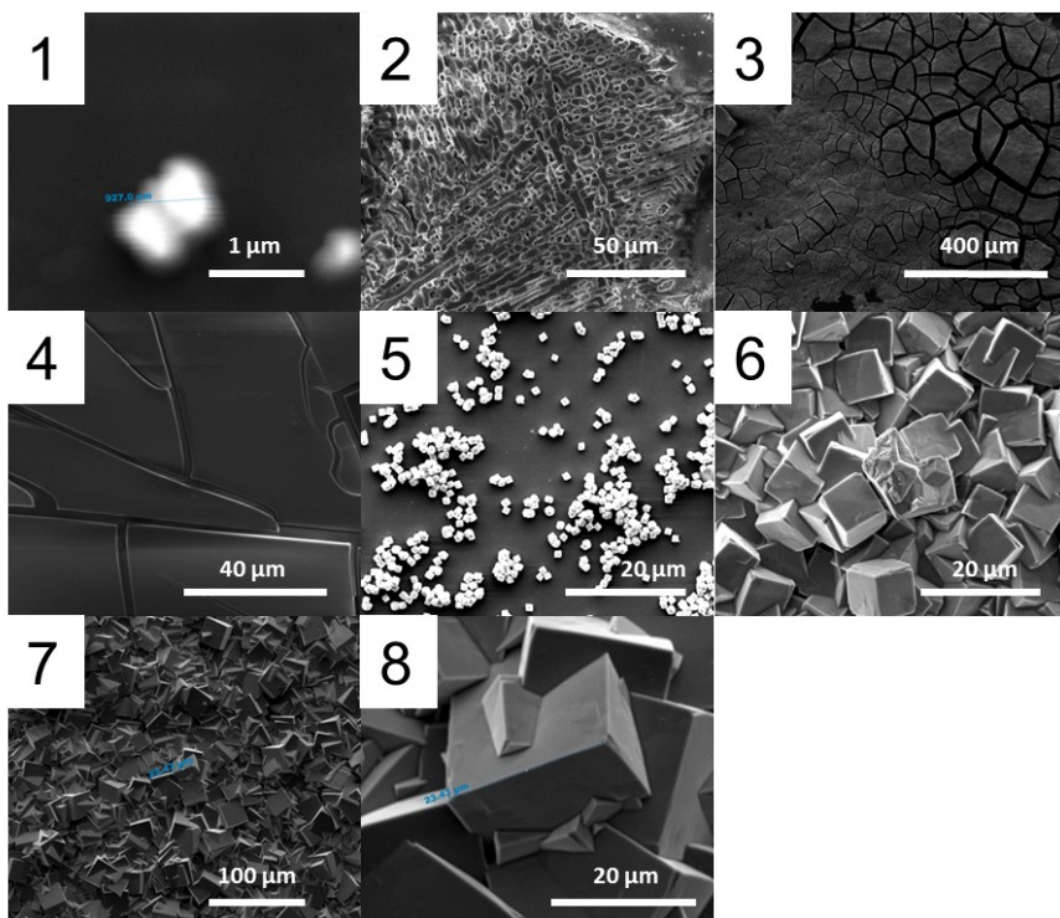


Fig S1. The corresponding SEM images of orthogonal experiments in Table S1.

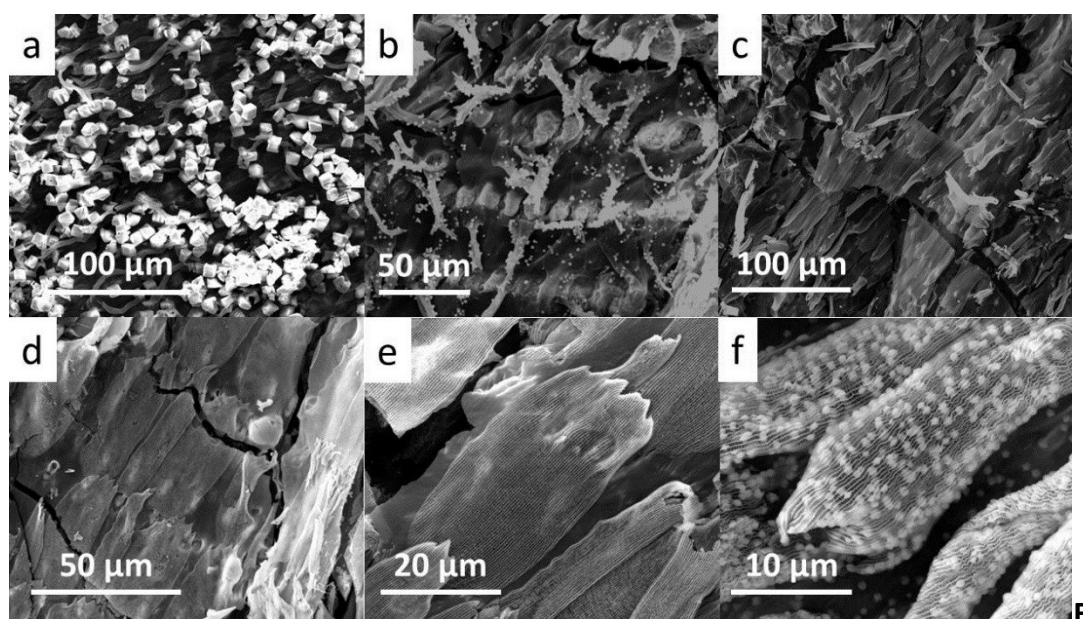


Fig. S2 The corresponding SEM images of sintered samples obtained in the conditions

mentioned in Table S2.

2. Repetitive experimental details of reflection spectra

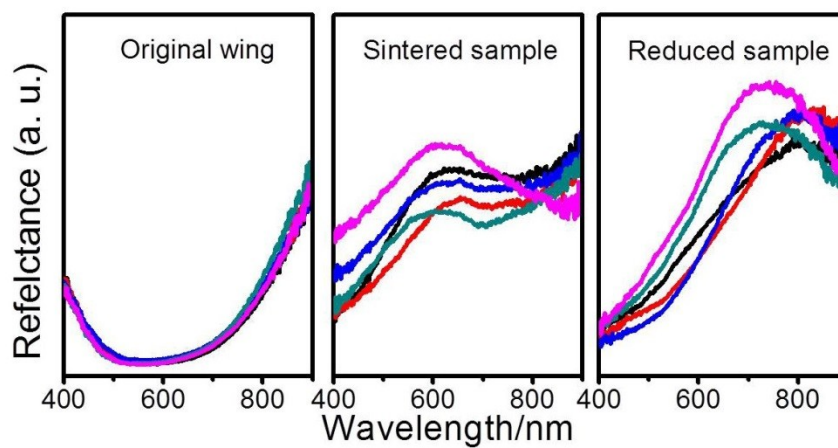


Fig. S3 Repetitive reflection spectra (different areas) of original wing, sintered sample and reduced sample.

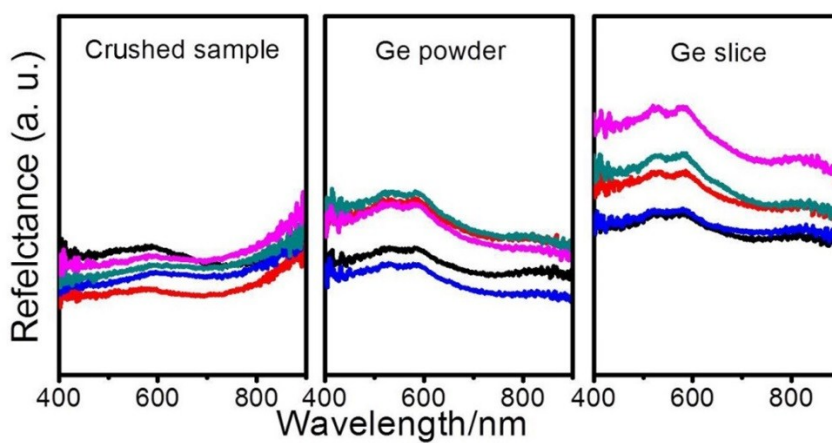


Fig. S4 Repetitive reflection spectra (different areas) of crushed sample, Ge powder and Ge slice.