Supplementary Material (ESI)

DNA participate in the preparation of hopper like NaCl crystals

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Experimental Section

All reagents and solvents were purchased from commercial sources and used as received without further purification. Chemicals used in this study included NaCl (A.R. 99.5 %, Sinopharm Group Chemical Reagent Co., Ltd., China), $AgNO_3$ (A.R. 99.8%, Sinopharm Group Chemical Reagent Co., Ltd., China); DNA, (Biotech Bioengineering (Shanghai) Co., Ltd., China); Acetone(A.R. 99.5%, Sinopharm Group Chemical Reagent Co., Ltd., China), Ultrapure water produced with a Milli-Q Integral 5 system was used in all experiments.

The DNA sequences were shown as follows,

DNA-1: 5'-CCCCCCCCCCCCTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT-3'

DNA-2: 5'-CCCCCCTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT-3'

DNA-3: 5'-AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA-3'

DNA-4: 5'-AAAAAAAAAAAAAAAAAAAAAAAA-3'

Synthesis of NaCl crystal

1. Preparation of DNA solution, NaCl solution and $AgNO_3$ solution

(1). DNA solution: First of all, DNA dry powder centrifuge 3 min at 10000 rpm, and then use the pipettes add 45 μl water into DNA powder, mix with shock, and get 100 μM DNA solution.

(2). $AgNO_3$ solution: First, 0.2550 g $AgNO_3$ was weighed into the 1 ml centrifuge tube with a balance, 1 ml of water was added to dissolved the $AgNO_3$, and then blended to obtain 1.5 M $AgNO_3$ solution. Then, 10 μl of the above $AgNO_3$ solution was aspirated with a pipette, diluted to 1 ml, and shaken to obtain a 1.5 mM $AgNO_3$ solution.

(3). NaCl solution: Weighing 0.1740 g NaCl with a balance, dissolved in 3 ml of water mixed evenly to get 3.00 M NaCl solution. And then absorb the above 3.00 M NaCl solution 750 μl, 500 μl, 250 μl, 100 μl and 50 μl were diluted to 1 ml, mixed even after the concentration of NaCl solution were 2.25 M, 1.50 M, 0.75 M, 0.30 M and 0.15 M.

2. Preparation of NaCl crystals

Take a piece of slides, immersed in the aqua regia 1 hour for cleaning, and then rinse with a lot of water to remove the aqua regia. Moreover wash it twice with ethanol and acetone, then wash it twice with water and dry at room temperature.

(1). Preparation conditions of NaCl crystals without $AgNO_3$.

25 μl of 3.00 M, 2.25 M, 1.50 M, 0.75 M, 0.30 M and 0.15 M NaCl solution were added to 25 μl of 100 uM DNA-1 solution using a pipett. After storage at room temperature for 1 hour, 10 μl of the mixed solution was added to the slide with a pipette and the solvent was gradually evaporated at room temperature to precipitate the NaCl crystals. The same procedure was used for DNA-2.

(2). Preparation conditions of NaCl crystals with different DNA with $AgNO_3$.

In a typical synthesis, the pipettes were sprayed with 100 uM of DNA-1 solution (15 uL) into a 200-mer centrifuge tube. Then, 0.15 M NaCl solution was added to the DNA-1 solution, followed by 6 ul of $AgNO_3$ and 6 ul of water. Shake mixing, room temperature storage 1 h, and then use the pipette to absorb the mixture 10ul drops on the slide. At room temperature, the solvent gradually evaporates and precipitates crystals. The same procedure was used for without DNA, DNA-3, DNA-4, DNA-1 and DNA-3, DNA-1 and DNA-4, respectively.

(3). Characterization of the prepared NaCl crystals.

The prepared NaCl crystals were characterized by optical microscopy, XRD and SEM. The phases of samples were characterized by X-ray diffraction (XRD, Cu Kα1 radiation, Rigaku /Ultima IV, Japan). The morphologies and structures of samples were studied using scanning electron microscopy (SEM, 3.0kV, SU70, Hitachi, Japan).

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No.	C_{NaCl}/mol·L^{-1}	C_{DNA-1}/μmol·L^{-1}	C_{Ag+}/μmol·L^{-1}
1	0.15	100	0
2	0.30	100	0
3	0.75	100	0
4	1.50	100	0
5	2.25	100	0
6	3.00	100	0

Table 1 Preparation conditions of NaCl crystals. V_{NaCl}=V_{DNA}=25 μl

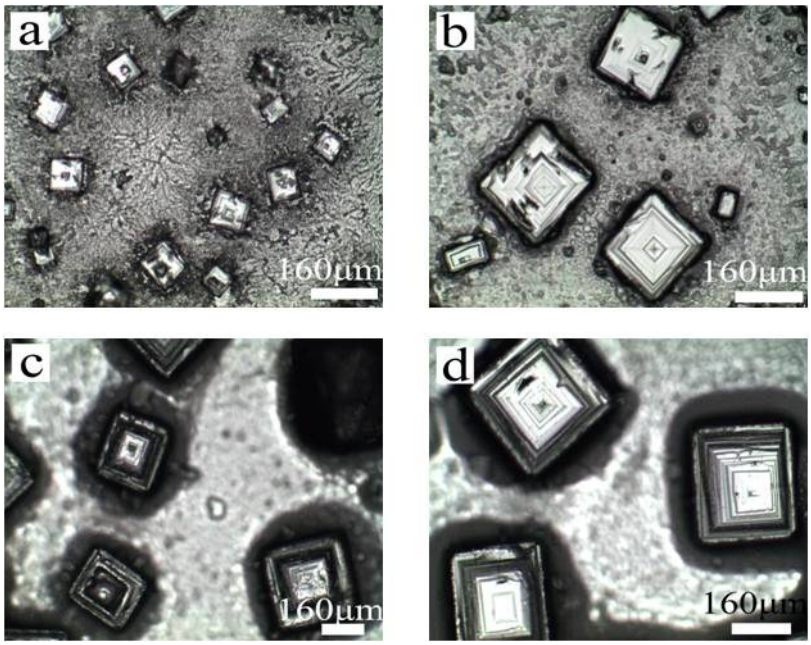

Figure S1. Optical Micrographs of hopper-like NaCl Crystals prepared by DNA-2. The concentration of DNA-2 was 100 mM, while the concentration of NaCl was 0.15 M (a), 0.75 M (b), 1.50 M (c), and 2.25 M (d). V_{NaCl}=V_{DNA}=25 μl

No.	V_{NaCl} /μl	V_{DNA}/μl	V_{AgNO3}/μl	V_{H2O}/μl
1	73	0	0	27
2	73	15 DNA-1	6	6
3	73	15 DNA-3	6	6
4	73	15 (DNA-1 and DNA-3)	6	6
5	73	15 (DNA-1 and DNA-4)	6	6

Table 2 Preparation conditions of NaCl crystals with different DNA.

C_{NaCl}=0.15 mol·L^{-1}, C_{DNA}=100 μmol·L^{-1}, C_{AgNO3}=1.5 mmol·L^{-1}

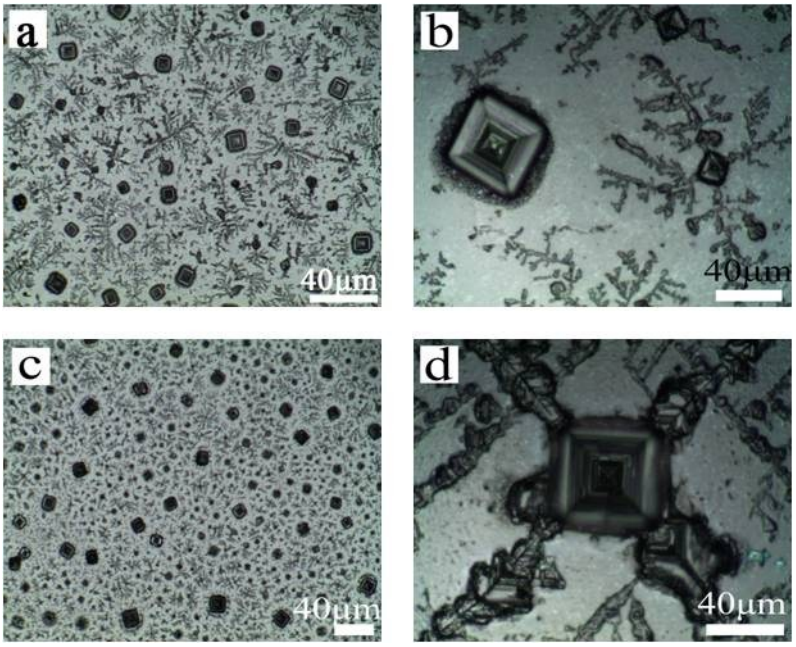

Figure S2. Optical Microscopes of Dendritic NaCl Crystals (a, b) prepared by 100 μmol·L^{-1} DNA-1, DNA-3, 0.15 mol·L^{-1} NaCl and 1.5 mmol·L^{-1} silver nitrate, (c, d) is prepared by 100 μmol·L^{-1} DNA-1, DNA-4, 0.15 mol·L^{-1} NaCl and 1.5 mmol·L^{-1} silver nitrate.

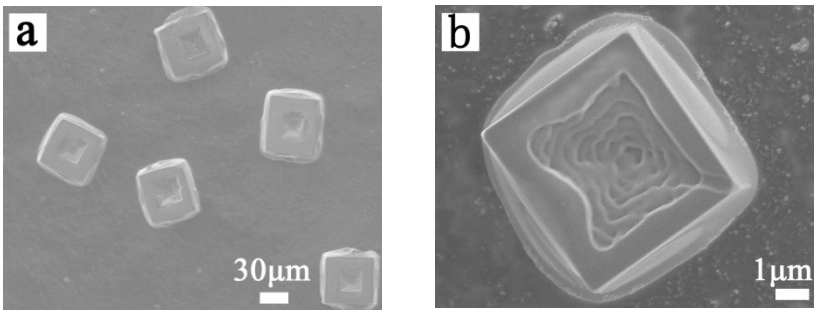

Figure S3. SEM images of irregular hopper-like NaCl crystals prepared by 50 μmol·L^{-1} DNA-2, 75 mmol·L^{-1} NaCl and 90 mmol·L^{-1} silver nitrate. (a) low magnification image, (b) high magnification image.