

## Supporting Information

### S-1 : INDEXING OF PEAKS FROM VALUE OF a FOR CUBIC STRUCTURE

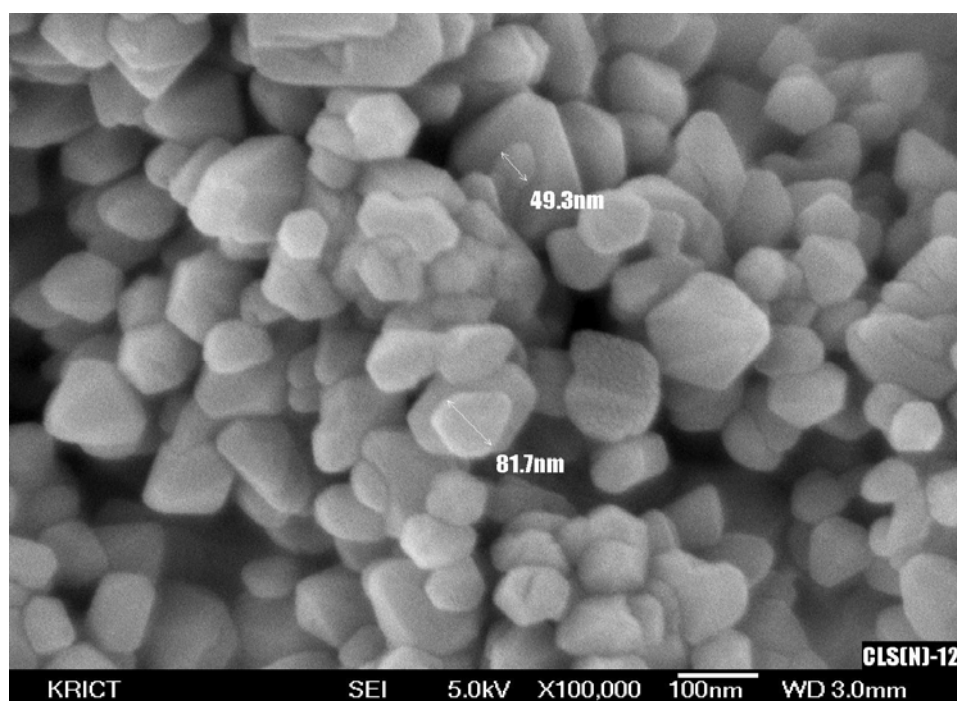
$$a=8.7033 \text{ \AA}$$

hkl	$N=h^2+k^2+l^2$	d	2 $\theta$ obs	2 $\theta$ obs for nanowires	$\Delta 2\theta$ for nanowires	(%I) nanowires	2 $\theta$ obs for prisms and Hexagons	$\Delta 2\theta$ for prisms and Hexagons	(%I) prisms and Hexagons
100	1	8.700	10.159				9.839	0.320	10.8
111	3	5.023	17.642	18.078	-0.436	100	17.673	-0.031	35.2
120	5	3.891	22.835				24.360	-1.525	72.5
121	6	3.552	25.047				24.910	0.137	12.1
220	8	3.076	28.997	27.5557	1.440	97.8	28.056	0.941	12.7
300	9	2.900	30.796				30.275	0.521	100
222	12	2.512	35.699	36.392	-0.693	92.3	35.829	-0.130	13.1
321	14	2.325	38.659				38.708	-0.049	3.7
401	17	2.110	42.767				42.887	-0.120	30.5
303	18	2.051	44.063	44.130	-0.067	97.3	43.802	0.261	59.2
420	20	1.945	46.567				46.726	-0.159	33.8
421	21	1.899	47.779				48.125	-0.346	6
332	22	1.855	48.967				49.923	-0.956	10.8
422	24	1.776	51.276	51.952	-0.676	92.7	51.920	-0.644	9.8
501	26	1.706	53.508				53.397	0.111	16.4
511	27	1.674	54.597				54.926	-0.329	2.2
521	30	1.588	57.773				57.050	0.723	10.3
522	33	1.515	60.827				60.964	-0.137	7.4
531	35	1.471	62.805				62.931	-0.126	8.3
602	40	1.376	67.572				67.920	-0.348	4.3
533	43	1.327	70.330				70.801	-0.471	11.3
622	44	1.312	71.234				72.115	-0.881	3.5
711	51	1.218	77.379				77.428	-0.049	4.5
702	53	1.195	79.083				79.201	-0.118	6.2

## S2: Intermediate information of formation mechanism

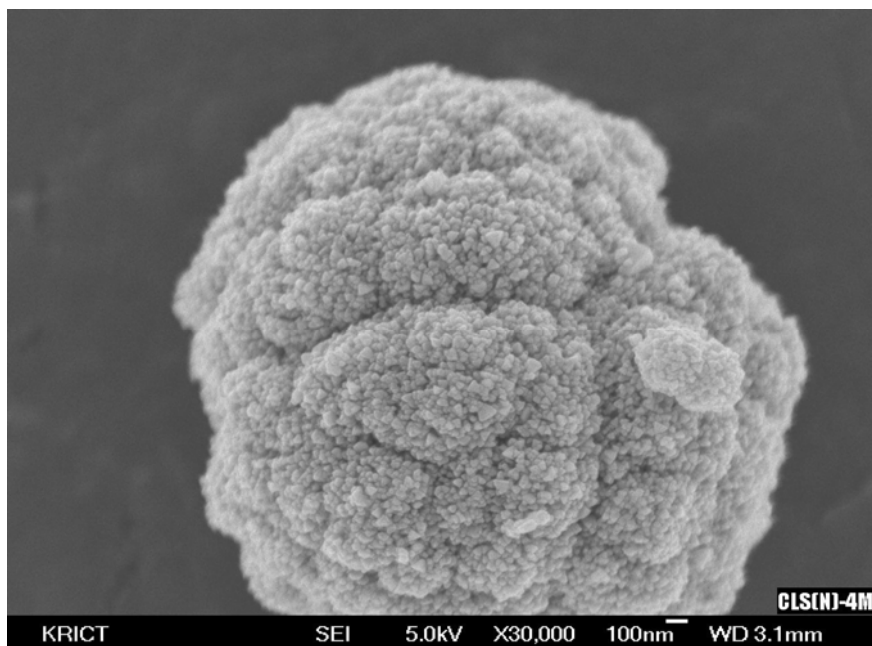
### a. The intermediate stage for formation of flowers of hexagons.

The following FESEM image shows the intermediate stage of formation of flowers of hexagons. The image clearly shows that the growth of hexagons originating from the spherical nanoparticles and these hexagons self organized into spherical assemblies. On the basis of these careful observations of image of the product obtained at 60 hr duration in aqueous medium, the mechanism for formation of flowers of hexagons has been proposed in the scheme **1a**.



### b. The formation of nanoprisms.

The following FESEM image represents the product obtained at 60 hr duration in methanol medium with 0.01 M precursor concentration. This image clearly shows cluster of small nanoparticles and some of them transformed into prism. The effect of methanol (reduction in size) is already explained in main text. On the basis of this observation, we proposed authentic mechanism for formation of nano prisms as presented in **scheme 1b**.



### c. The formation of nanowires.

The following FESEM image represent the product obtained at 60 hr in methanol medium with 0.005 M precursor concentration. This image clearly shows spherical nanoparticles ( shown by arrows ) self aligned in the form of nanowires. This indicates that at longer reaction time all self aligned spherical nanoparticles transformed into nanowires. At lower concentration in methanol medium, the growth of the nanoparticles slows down and hence one dimensional growth accelerated.via self alignment of spherical nanoparticles. On the basis of these careful observations, we proposed authentic mechanism for formation of nanowires as presented in **scheme1c**

