Electronic Supplemental Information (ESI) for:

Ultrasonication-Switched Formation of Dice- and Cubic-Shaped Fullerene Crystals and Their Applications as Catalyst Supports for Methanol Oxidation

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S1. Size distributions of cubic- and dice-shaped $Sc_3N@C_{80}$ crystals.

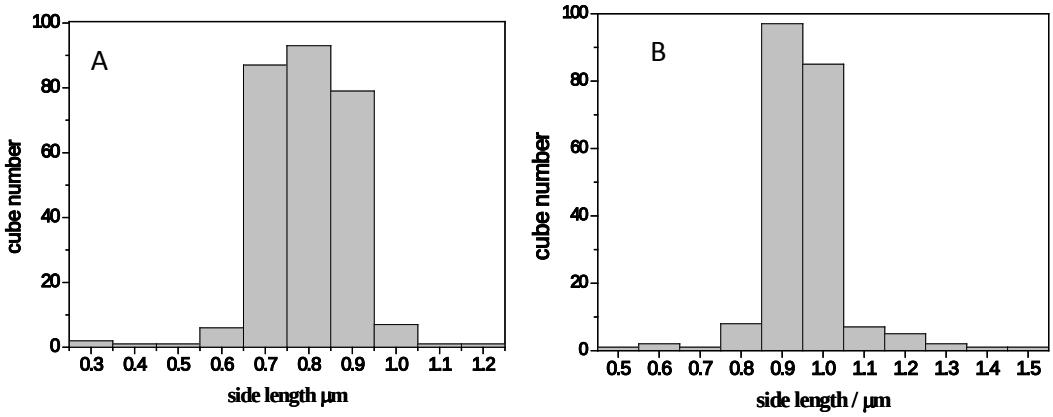

Fig. S1 Size distribution of cubic- (A) and dice-shaped (B) $Sc_3N@C_{80}$ crystals. The initial concentration of $Sc_3N@C_{80}$ solution in mesitylene was set as 0.1 mg/mL.

S2. SEM images of cubic- and dice-shaped $Sc_3N@C_{80}$ crystalsobtained underinitial concentration of $Sc_3N@C_{80}$ solution of 0.05 mg/mL.

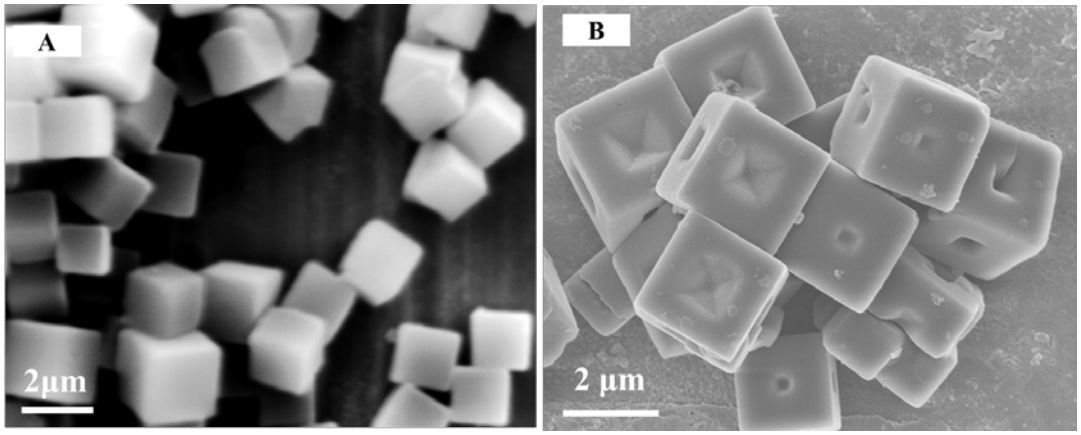

Fig. S2 SEM images of cubic- (A) and dice-shaped (B) $Sc_3N@C_{80}$ crystals. The initial concentration of $Sc_3N@C_{80}$ solution is 0.05 mg/mL.

S3. SEM image of cubic $Sc_3N@C_{80}$ crystals by applying vigorous vibration during mixing the good/poor (mesitylene/isopropanol) solvents.

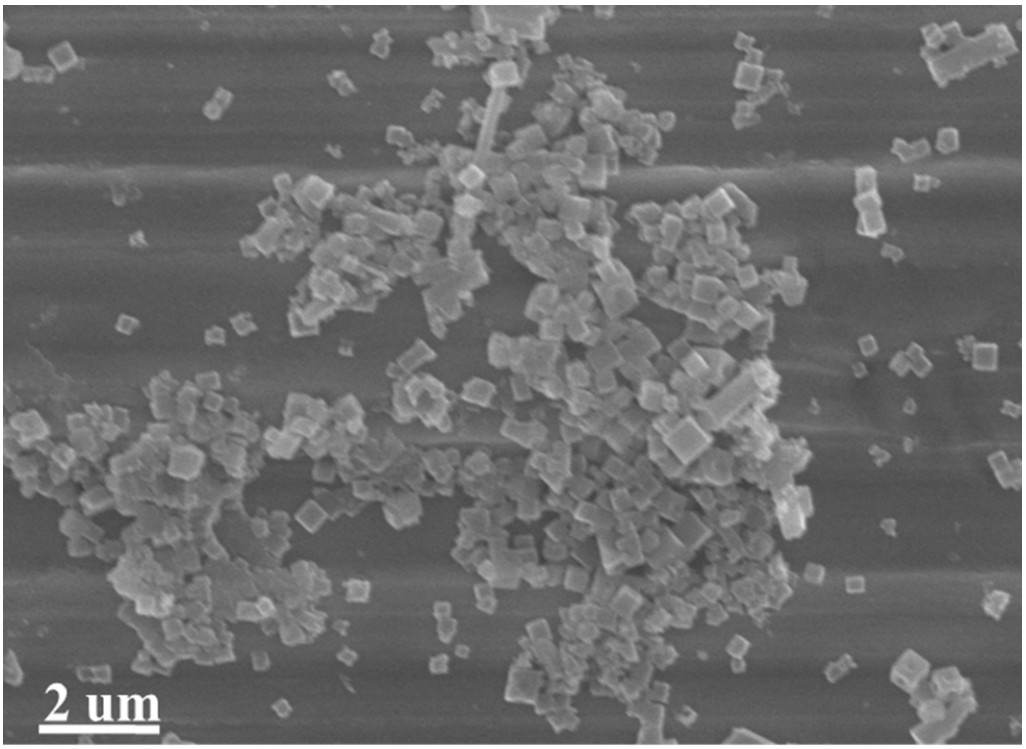

Fig. S3 SEM image of nonuniform cubic $Sc_3N@C_{80}$ crystals by applying vigorous vibration when mixing the good/poor (mesitylene/isopropanol) solvents.

S4. SEM images of $Sc_3N@C_{80}$ crystals by using *p*-xylene and *m*-xylene dissolving $Sc_3N@C_{80}$.

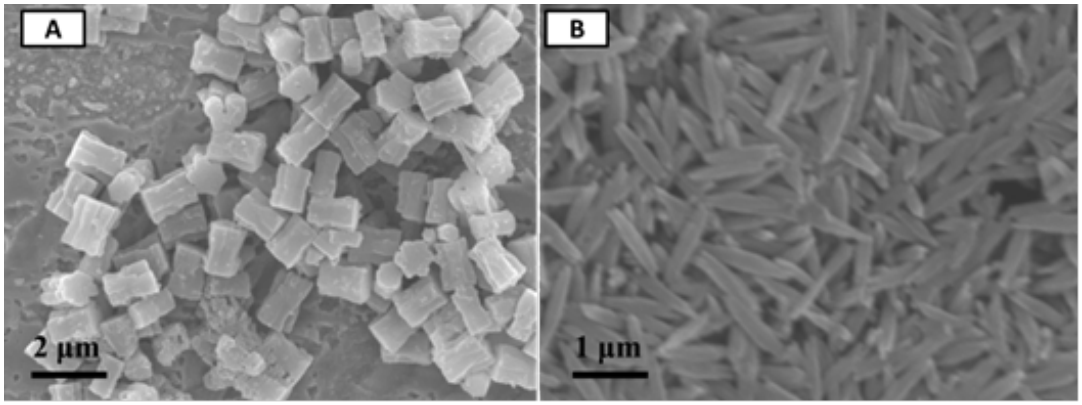

Fig. S4 SEM images of micron-sized rods by using *p*-xylene dissolving $Sc_3N@C_{80}$ (A) and needle-like rods by using *m*-xylene dissolving $Sc_3N@C_{80}$ (B).

S5. SEM images of $Sc_3N@C_{80}$ crystals obtained by using different poor solvents.

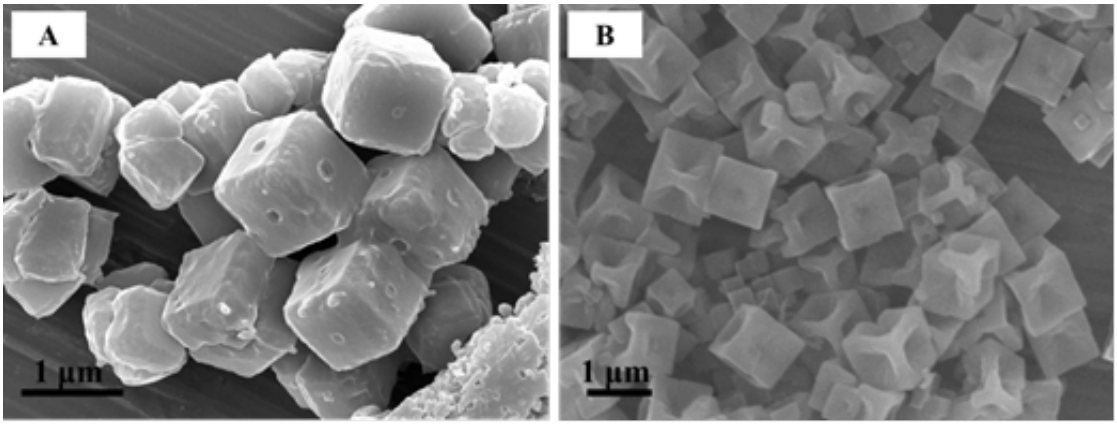

Fig. S5 SEM images of $Sc_3N@C_{80}$ crystals obtained by using low-polar *n*-hexane (A) or high-polar acetone (B) substituting isopropanolas the poor solvent.

S6. SEM images of $Sc_3N@C_{80}$ crystals obtained from different mixing ratio of mesitylene to isopropanol.

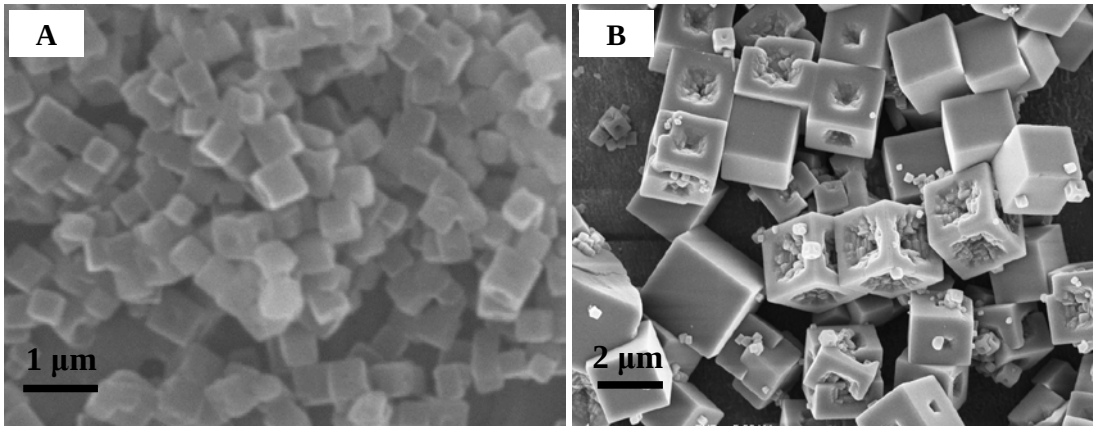

Fig. S6 SEM images of $Sc_3N@C_{80}$ crystals obtained from different mixing ratio of mesitylene to isopropanol. (A) mesitylene:IPA = 1:1 (v/v), (B) mesitylene:IPA = 1:5 (v/v).

S7. TGA curve of $Sc_3N@C_{80}$ dices measured under N_2 atmosphere.

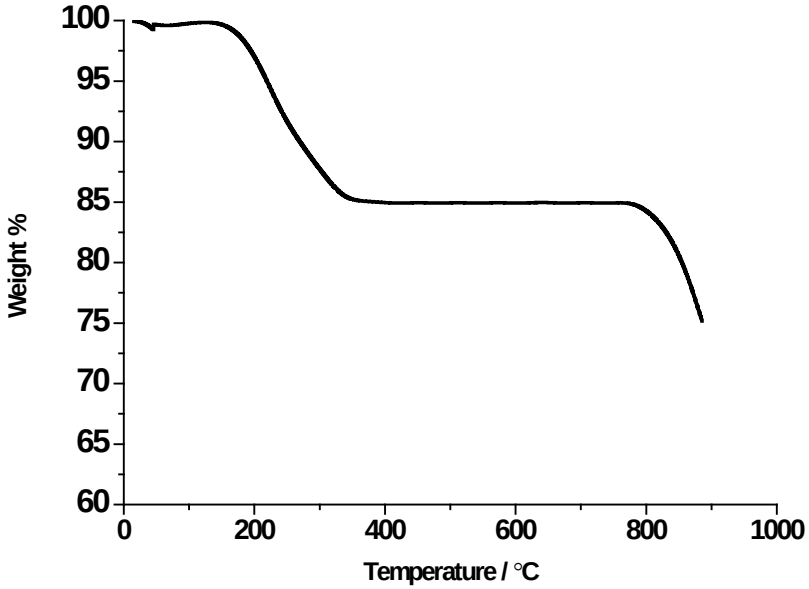

Fig. S7 TGA curve of dices measured under N_2. The ratio of mesitylene to $Sc_3N@C_{80}$ is 1.6:1.

S8. FTIR spectra of $Sc_3N@C_{80}$ dices and cubes.

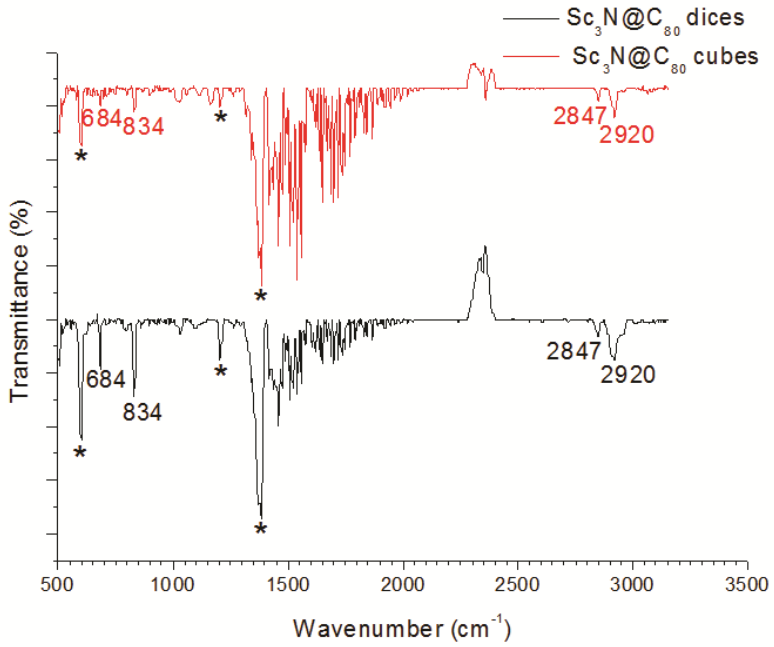

Fig. S8 FTIR spectra of $Sc_3N@C_{80}$ dices and $Sc_3N@C_{80}$ cubes. The asterisks and numbers label the characteristic vibrational lines of $Sc_3N@C_{80}$ and mesitylene molecules, respectively.

S9. Detailed indexing data of $Sc_3N@C_{80}$ cubes.

Crystal system: Cubic Lattice Type: P
Lattice Parameter: a= 10.8 b= 10.8 c= 10.8
Lattice Parameter: Alpha= 90 Beta= 90 Gama=90
Radiation: Cu WaveLength: 1.540598
2Theta Start= 3 2Theta End= 30

H	K	L	d	2Theta
1	0	0	10.80000	8.180
1	1	0	7.63675	11.578
1	1	1	6.23538	14.193
2	0	0	5.40000	16.402
2	1	0	4.82991	18.354
2	1	1	4.40908	20.123
2	2	0	3.81838	23.277
2	2	1	3.60000	24.710
3	0	0	3.60000	24.710
3	1	0	3.41526	26.070
3	1	1	3.25632	27.367
2	2	2	3.11769	28.609
3	2	0	2.99538	29.804

S10. Chronoamperometric curves of $Pt/Sc_3N@C_{80}$ dices/ITO, $Pt/Sc_3N@C_{80}$ cubes/ITO and Pt/ITO electrodes.

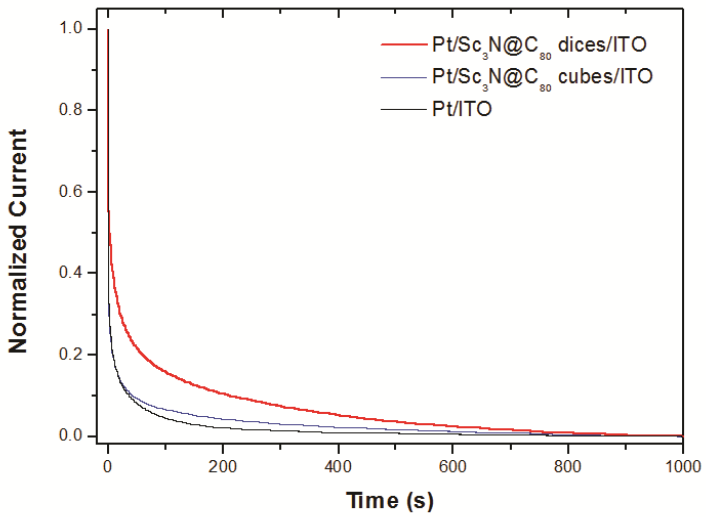

Fig. S9 Chronoamperometric curves of $Pt/Sc_3N@C_{80}$ dices/ITO, $Pt/Sc_3N@C_{80}$ cubes/ITO and Pt/ITO electrodes performed at 0.81 V in 1.0 M H_2SO_4 solution. The curves were normalized to the initial current.