SUPPORTING INFORMATION

Supercritical Hydrothermal Synthesis of MoS_2 Nanosheets with Controllable Layer Number and Phase Structure

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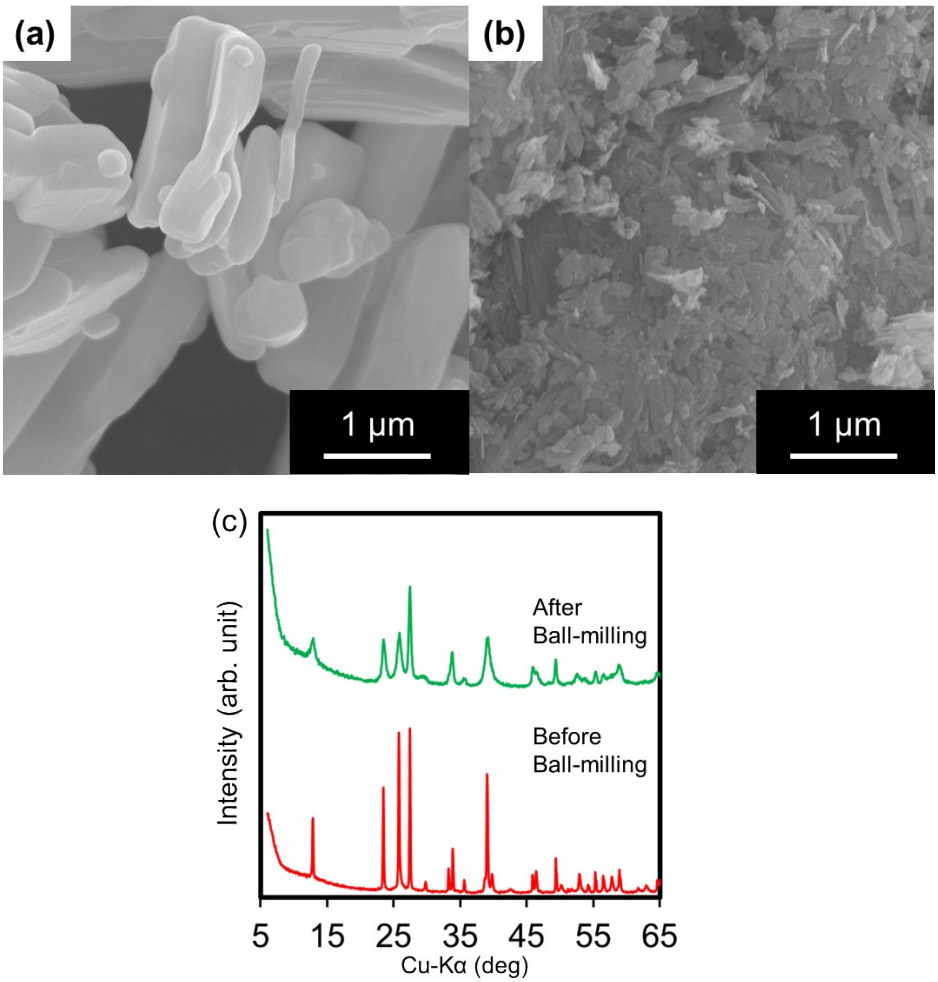

Figure S1 SEM images of (a) pristine MoO_3 and (b) Ball-milled MoO_3, (c) The XRD patterns of MoO_3 before and after the ball-milling

Table S1 FWHM of 100 plane of synthesized in 30 mins at different reaction temperature.

Temperature [°C]	Degree [2θ]	FWHM
400	33.5	1.74
350	33.3	1.84
300	33.3	3.00

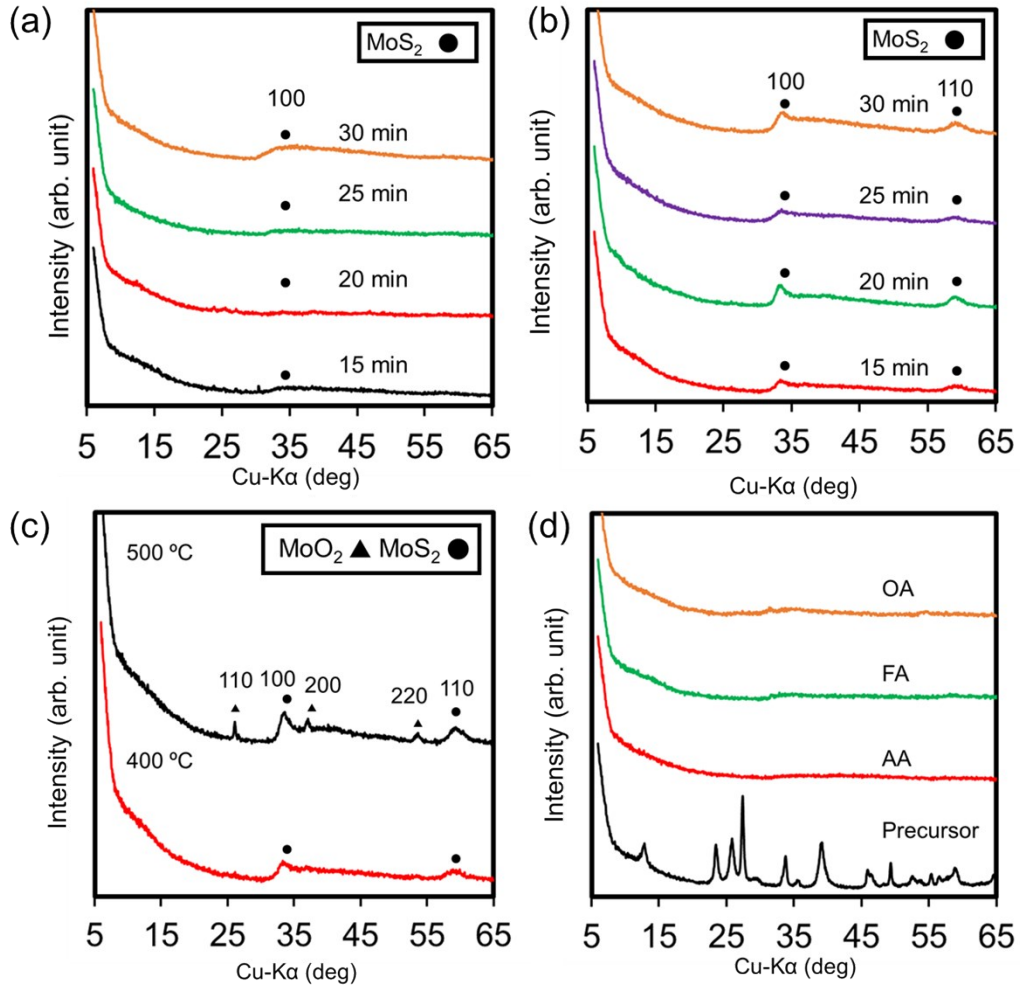

Figure S2 The XRD patterns of synthesized samples (a) Products synthesized with AA as a reducing agent in 300°C for different reaction times (b) Products synthesized with AA as a reducing agent at 350°C for different reaction times (c) Products synthesized with AA as a reducing agent at 500°C for 30 min (d) Products synthesized at 200°C for 24 hour with different reducing agents.

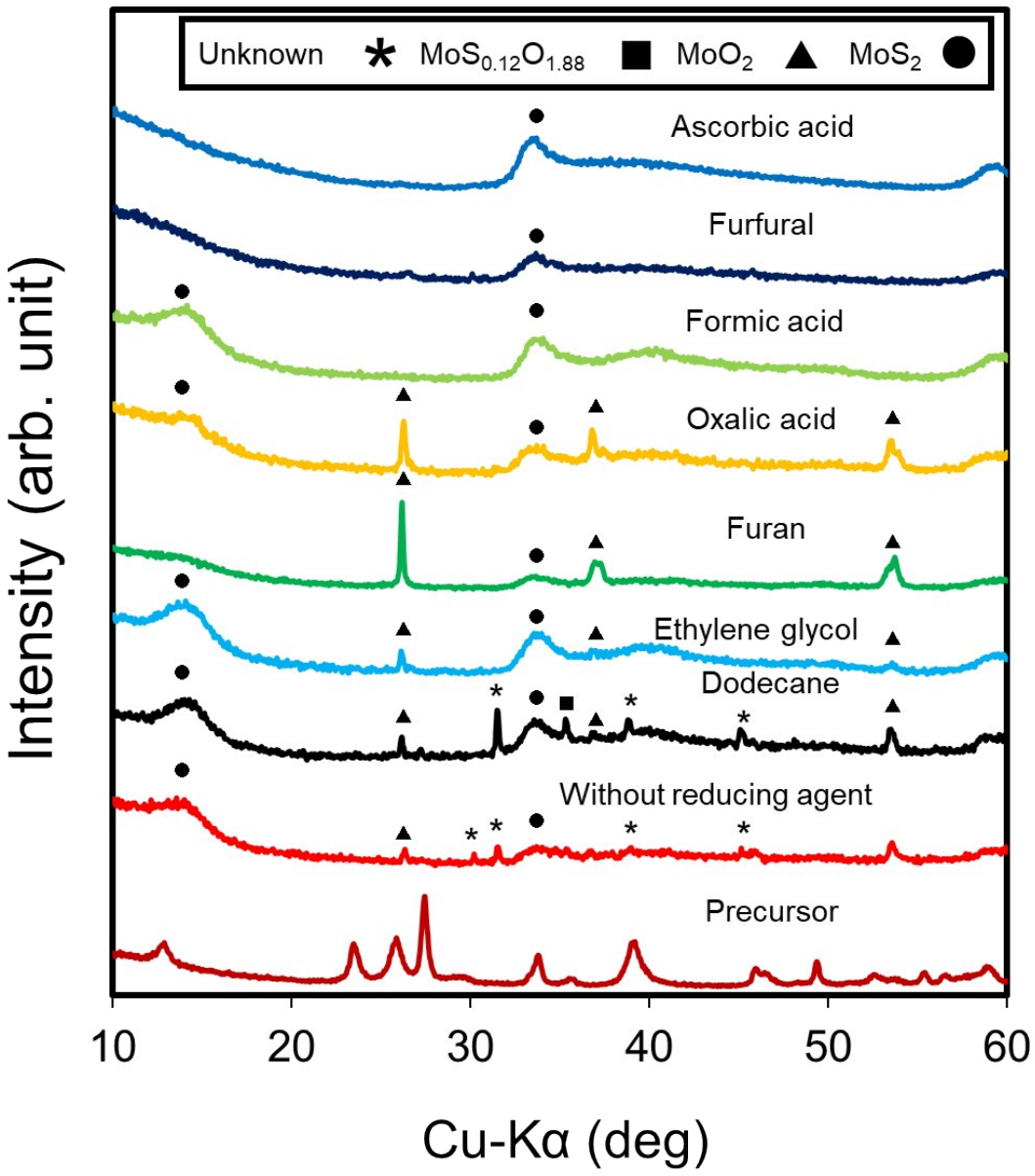

Figure S3 The result of XRD patterns of samples synthesized using different organic substances

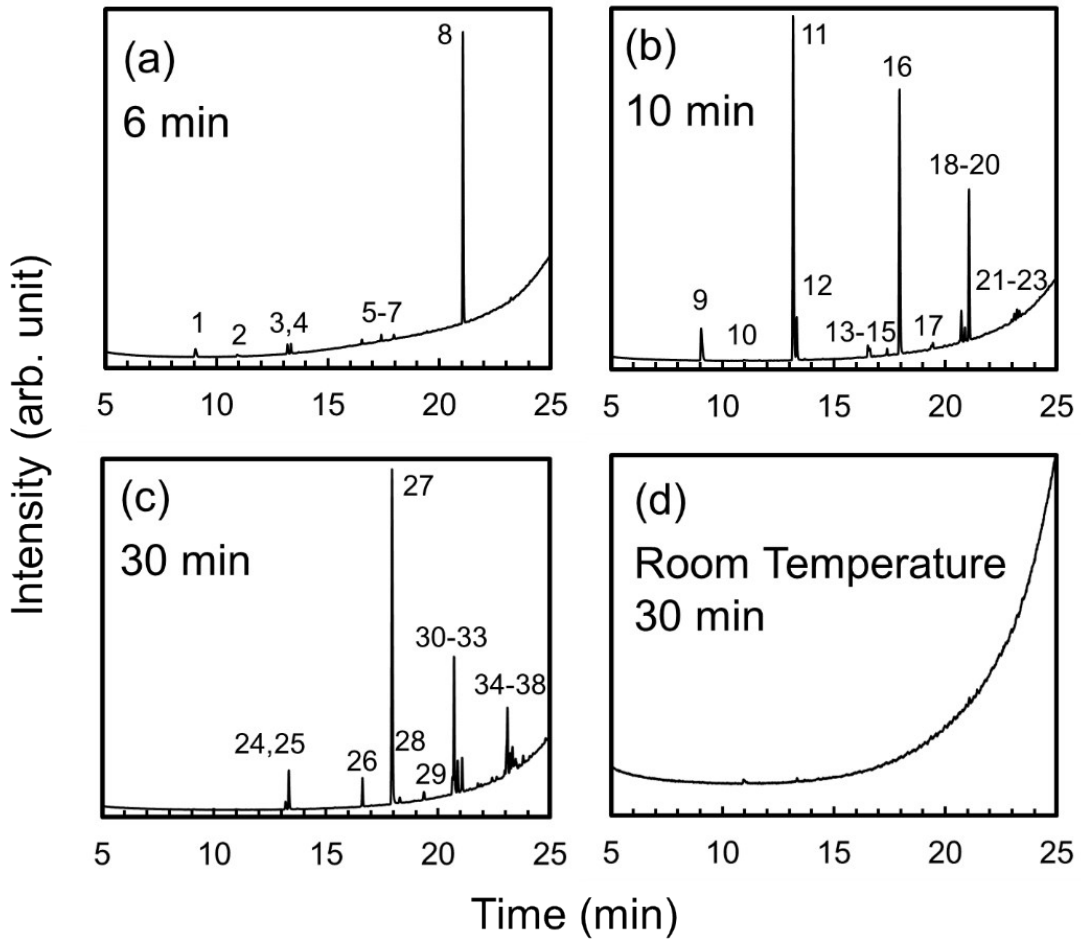

Figure S4 The results of GC-MS measurement for filtrate after MoS2 synthesis reaction with AA under different conditions (a)400°C, 6 min (b) 400°C, 10 min (c) 400°C, 30 min (d)Room temperature, 30min

Table S2 The result of GC-MS measurement for filtrate after the reaction (AA 6 min)

Time [min]	Peak number	Name of substance
9.0543	1	Acetaldehyde
10.9285	2	Ethanol
13.184	3	Furan
13.3366	4	Acetone
16.5292	5	Diacetyl
17.39	6	Crotonaldehyde
17.9567	7	Thiophene
21.0512	8	Furfural

Table S3 The result of GC-MS measurement for filtrate after the reaction (AA 10 min)

Time [min]	Peak number	Name of substance
9.0544	9	Acetaldehyde
10.9721	10	Ethanol
13.1732	11	Furan
13.3367	12	Acetone
16.5838	13	2-Methylfuran
16.7908	14	3-Methylfuran
17.3901	15	Crotonaldehyde
17.9458	16	Thiophene
19.3841	17	2-Ethylfuran
20.7135	18	3-Methylthiophene
20.877	19	3-Methylthiophene
21.0622	20	Furfural
23.0998	21	2-Ethylthiophene
23.2197	22	2,4-Dimethylthiophene
23.2177	23	2,3-Dimethylthiophene

Table S4 The result of GC-MS measurement for filtrate after the reaction (AA 30 min)

Time [min]	Peak number	Name of substance
13.1842	24	Furan
13.3368	25	Acetone
16.6275	26	2-Butanone
17.9459	27	Tiophene
18.2837	28	1,3-Hexadien-5-yne
19.3624	29	2-Pentanone
20.6482	30	Cyclopentanone
20.7136	31	3-Methylthiophene
20.8771	32	3-Methylthiophene
21.0732	33	Toluene
22.98	34	2-Methyl-2-cyclopenten-1-one
23.089	35	2-Ethyltiophene
23.2198	36	2,5-Dimethylthiophene
23.3178	37	2,4-Dimethylthiophene
23.7973	38	p-Xylene

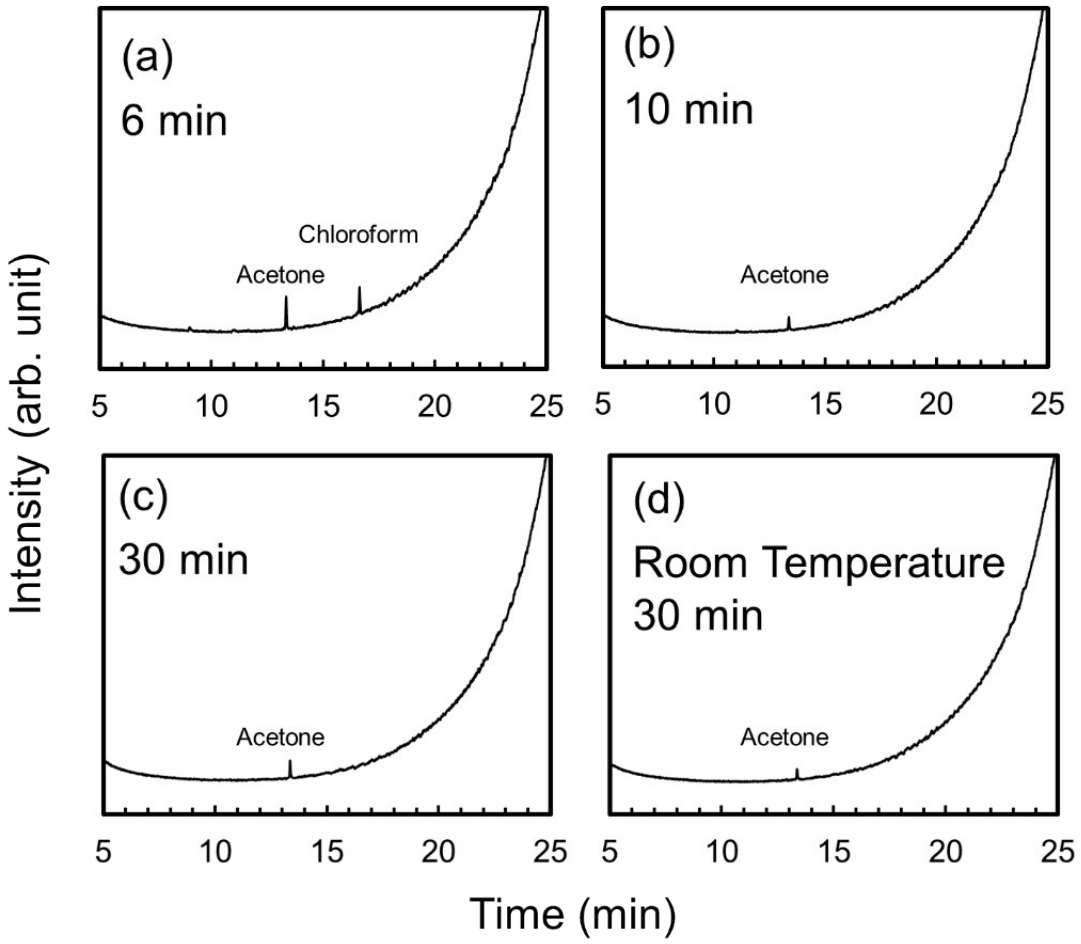

Figure S5 The results of GC-MS measurement for filtrate after the MoS_2 synthesis reaction with FA (a) 400°C, 6 min (b) 400°C, 10 min (c) 400°C, 30 min (d)Room temperature, 30min

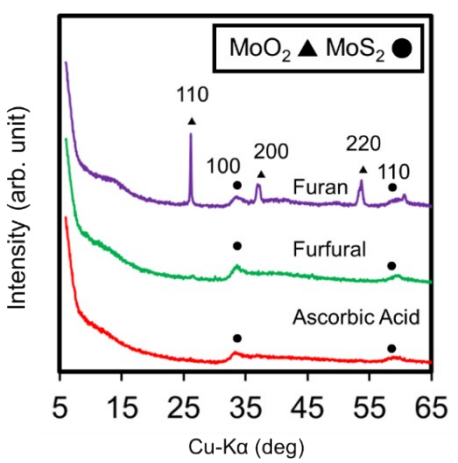

Figure S6 The comparison of XRD patterns of samples synthesized with Furan, Furfural and ascorbic acid. Furan and Furfural is formed by decomposition of AA.

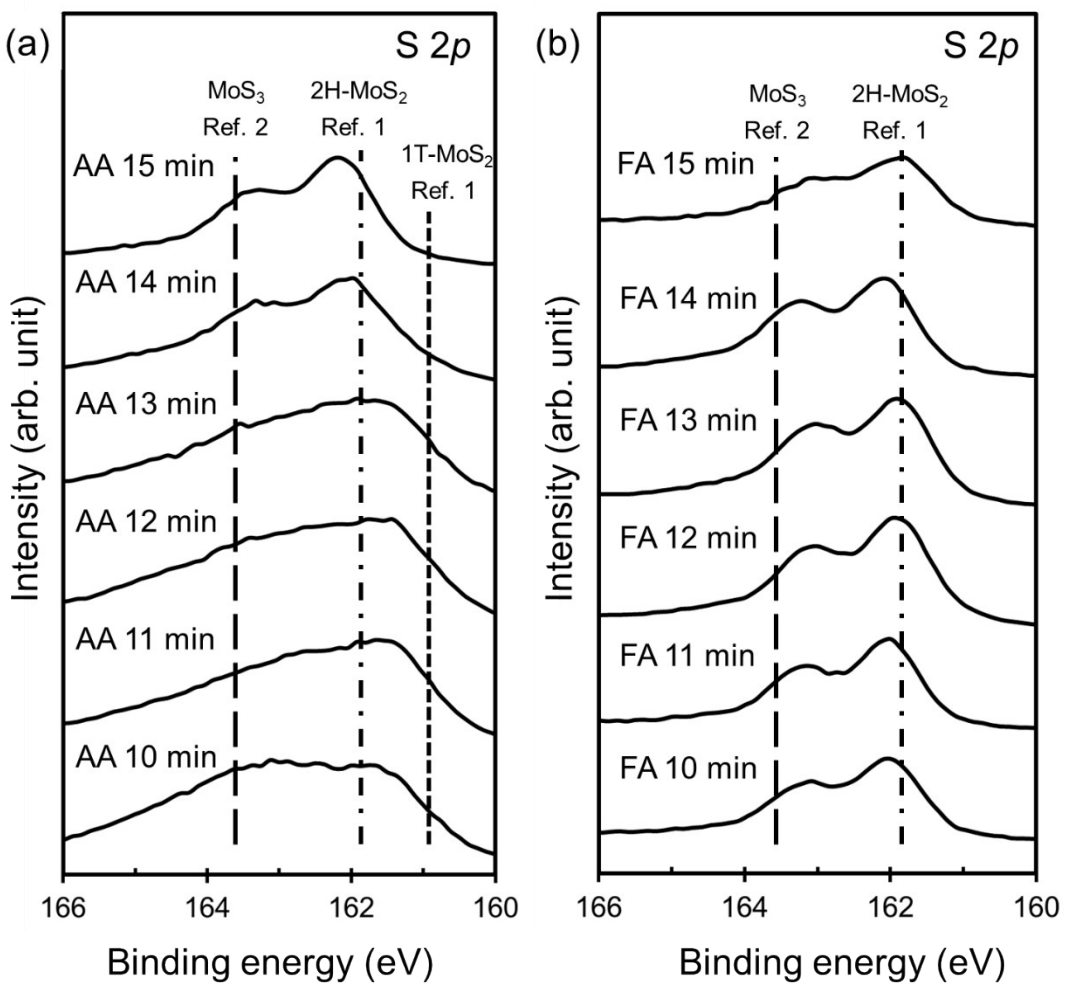

Figure S7 XPS spectra of synthesized samples. (a) Products synthesized with AA as a reducing agent for different reaction times. (b) Products synthesized with FA as a reducing agent for different reaction times.

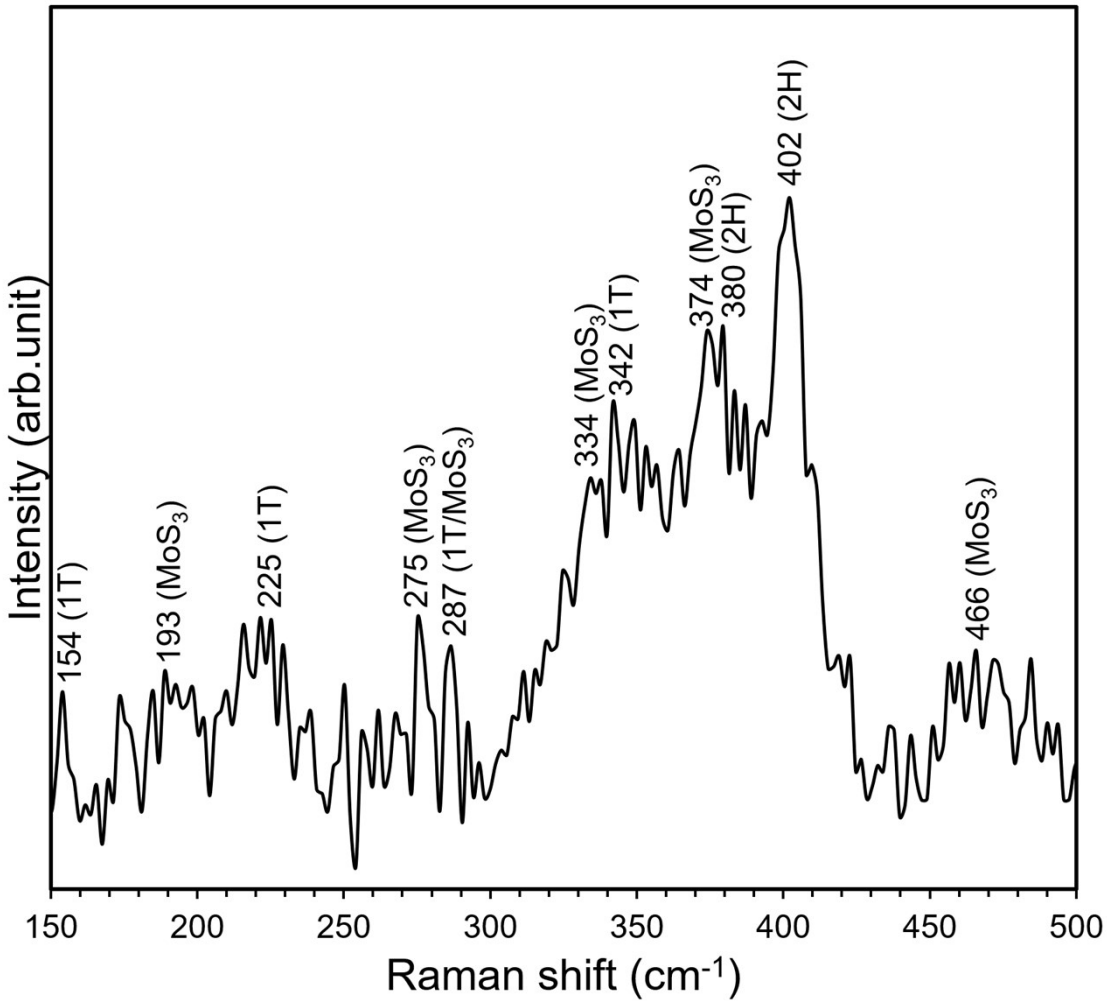

Figure S8 Raman spectrum of the sample synthesized with AA for 12 min.

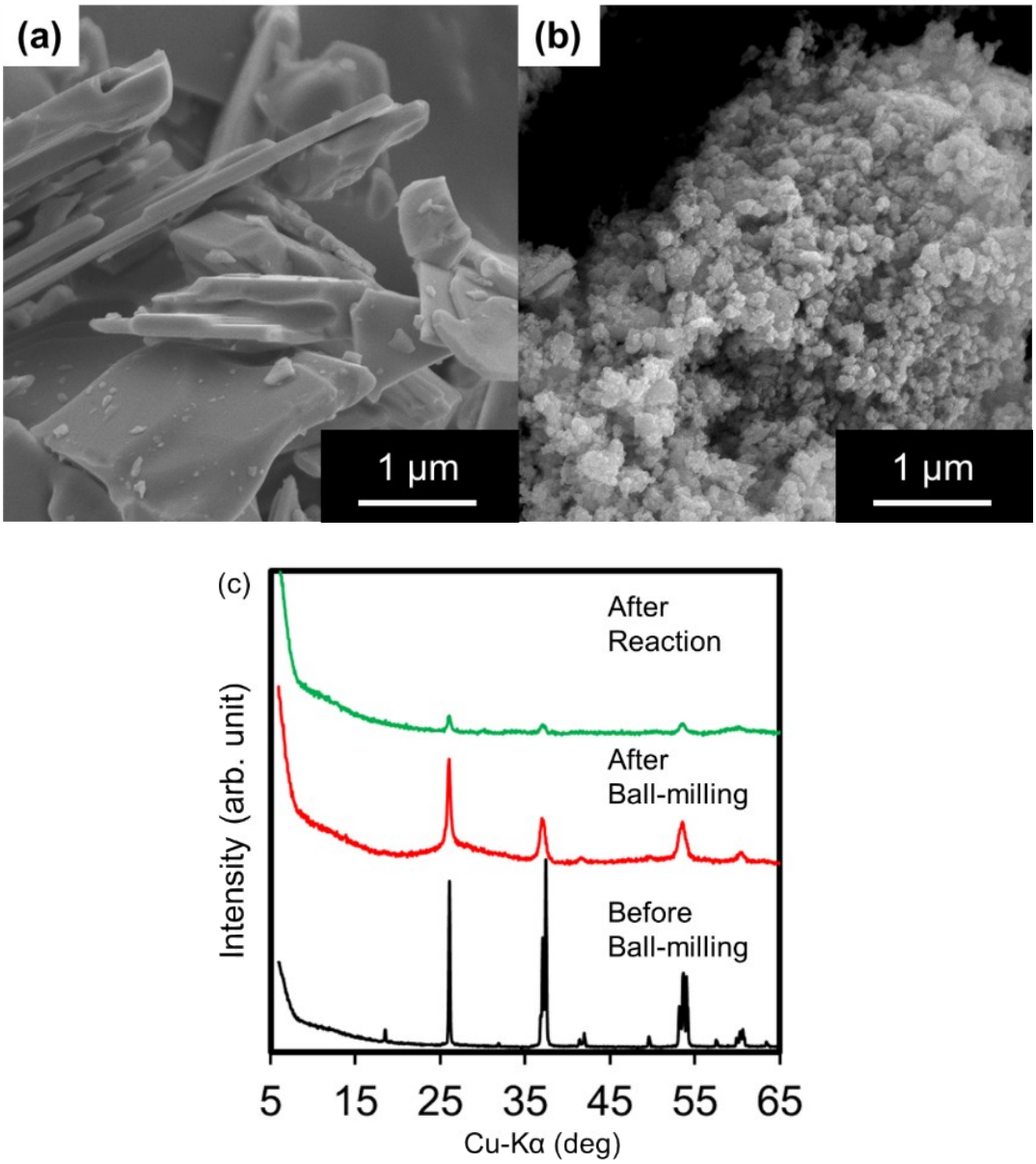

Figure S9 SEM images of (a) pristine MoO_2 and (b) Ball-milled MoO_2, (c) The XRD patterns of synthesized samples using MoO_2 as a precursor and AA as a reducing agent for 30 mins.