APPENDIX A

The size distribution evaluated from
transmission electron microscope (TEM) micrograph

A.1 The Size Distribution

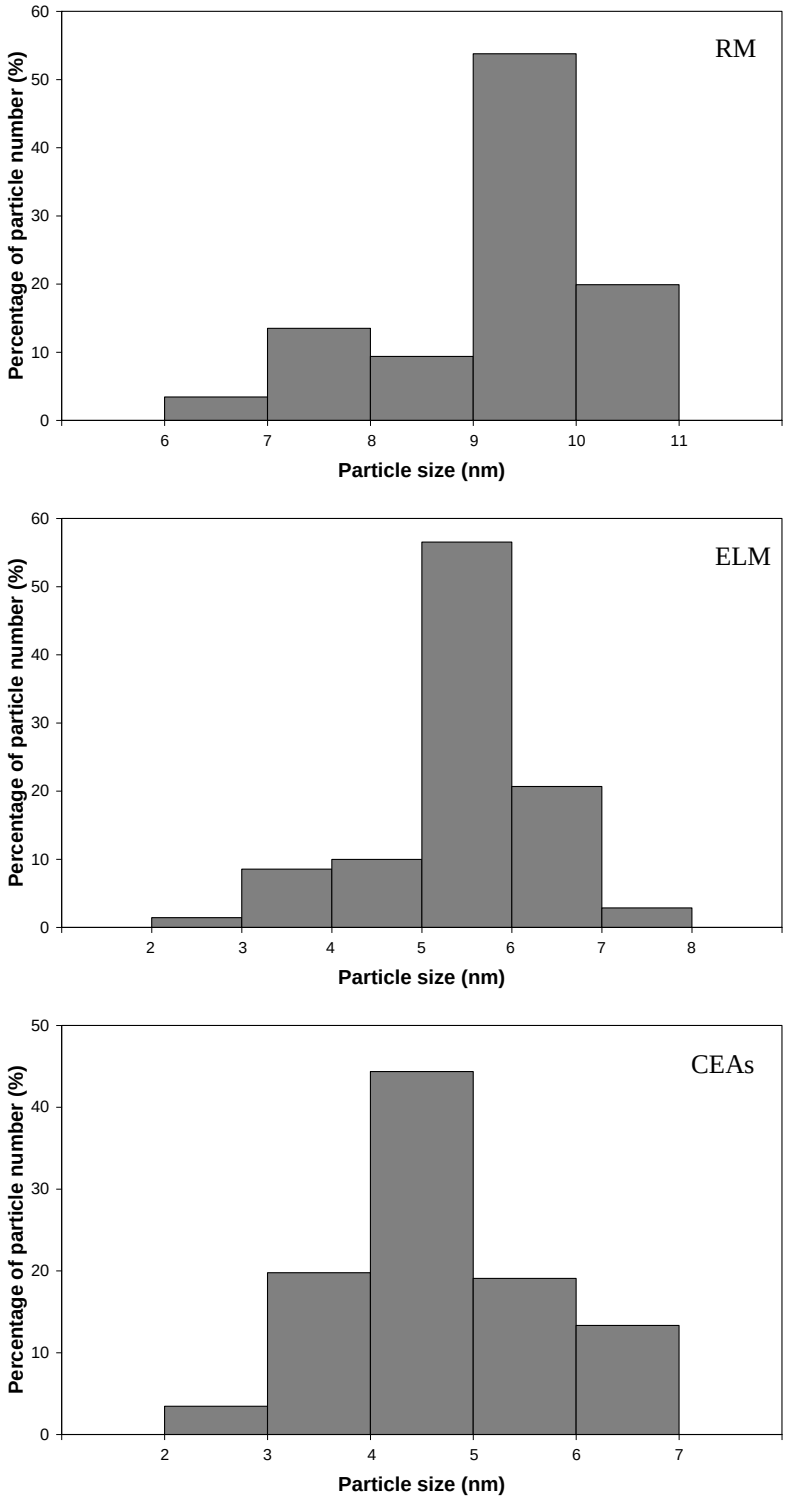

Figure A.1 The size distribution of CeO_2 prepared by different methods.

Table A.1 The size distribution of CeO_2 prepared by RM method.

Particle size (nm)	Number of particles	Frequency (%)
6-7	15	3.43
7-8	59	13.50
8-9	41	9.38
9-10	235	53.78
10-11	87	19.91
Total	**437**	**100.00**

Table A.2 The size distribution of CeO_2 prepared by ELM method.

Particle size (nm)	Number of particles	%
2-3	6	1.43
3-4	36	8.55
4-5	42	9.98
5-6	238	56.53
6-7	87	20.67
7-8	12	2.85
Total	**421**	**100.00**

Table A.3 The size distribution of CeO_2 prepared by CEAs method.

Particle size (nm)	Number of particles	Frequency (%)
2-3	15	3.45
3-4	86	19.77
4-5	193	44.37
5-6	83	19.08
6-7	58	13.33
Total	**435**	**100.00**

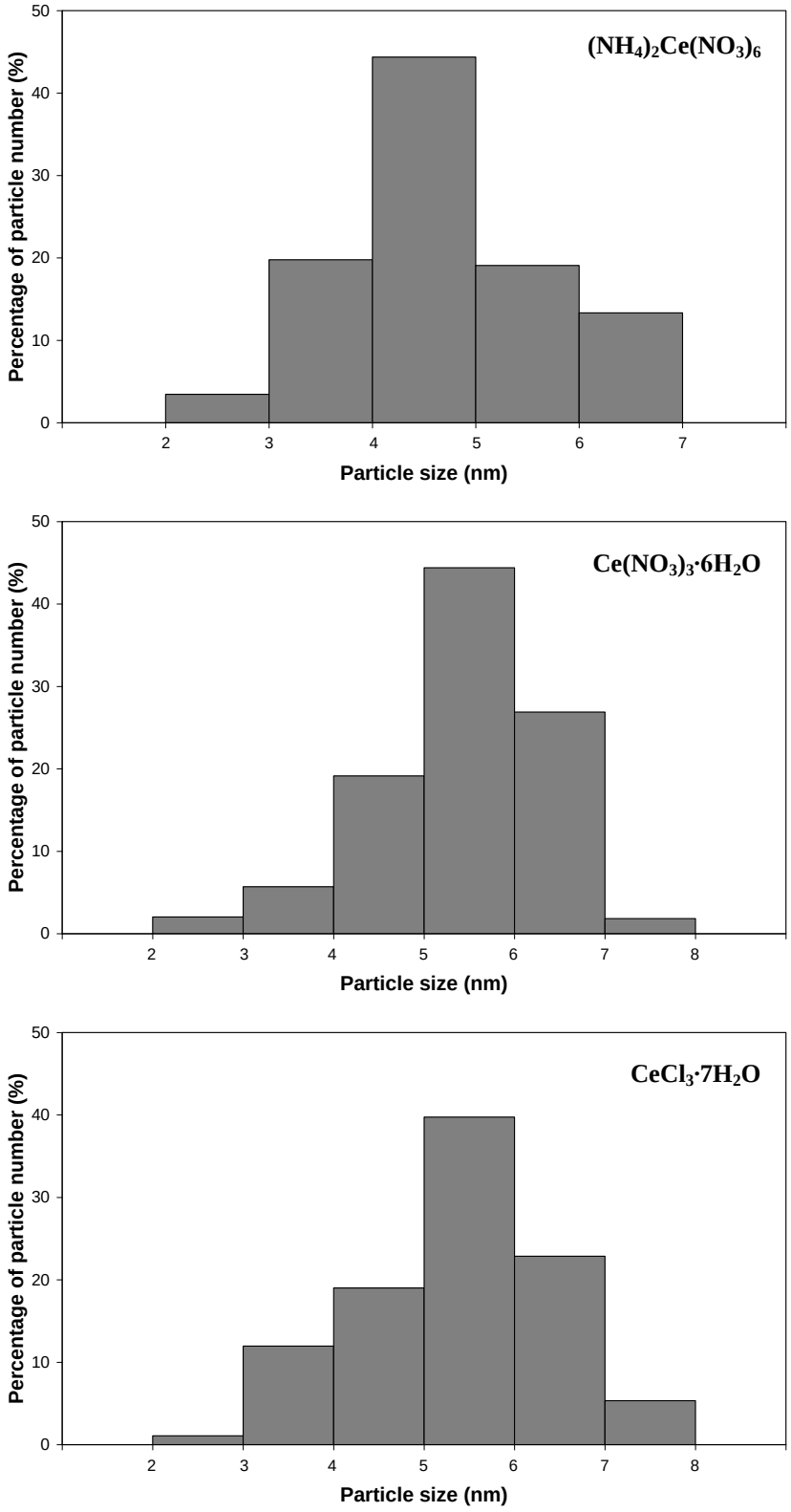

Figure A.2 The size distribution of CeO_2 prepared by different cerium sources.

Table A.4 The size distribution of CeO_2 particles prepared by CEAs method : $(NH_4)_3Ce(NO_3)_2$ as a cerium source.

Particle size (nm)	Number of particles	Frequency (%)
2-3	15	3.45
3-4	86	19.77
4-5	193	44.37
5-6	83	19.08
6-7	58	13.33
Total	**435**	**100.00**

Table A.5 The distribution of CeO_2 particles prepared by CEAs method : $Ce(NO_3)_3 \cdot 6H_2O$ as a cerium source.

Particle size (nm)	Number of particles	Frequency (%)
2-3	10	2.04
3-4	28	5.70
4-5	94	19.14
5-6	218	44.40
6-7	132	26.88
7-8	9	1.83
Total	**491**	**100.00**

Table A.6 The size distribution of CeO_2 particles prepared by CEAs method : $CeCl_3 \cdot 7H_2O$ as a cerium source.

Particle size (nm)	Number of particles	Frequency (%)
2-3	5	1.07
3-4	56	11.97
4-5	89	19.02
5-6	186	39.74
6-7	107	22.86
7-8	25	5.34
Total	**468**	**100.00**

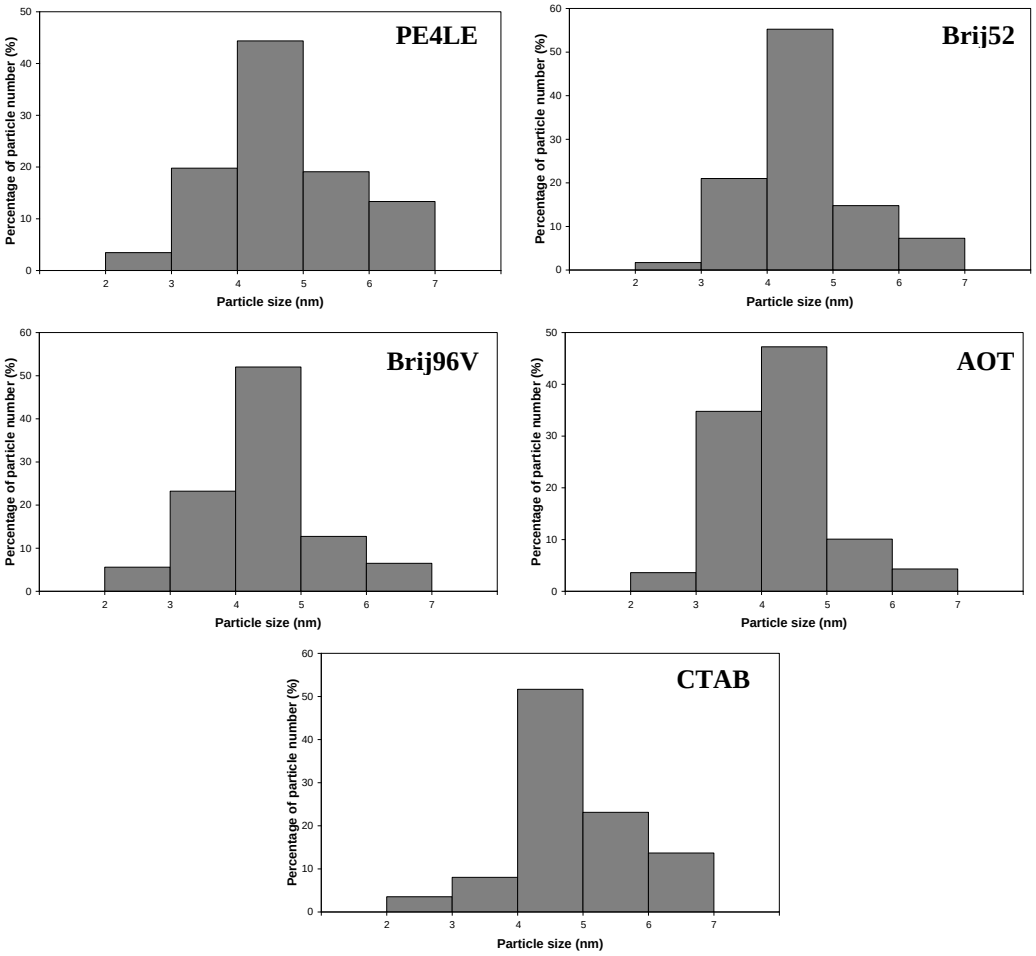

Figure A.3 The size distribution of CeO_2 prepared by different surfactants.

Table A.7 The size distribution of CeO_2 particles prepared by CEAs method : PE4LE as a surfactant.

Particle size (nm)	Number of particles	Frequency (%)
2-3	15	3.45
3-4	86	19.77
4-5	193	44.37
5-6	83	19.08
6-7	58	13.33
Total	**435**	**100.00**

Table A.8 The size distribution of CeO_2 particles prepared by CEAs method : Brij52 as a surfactant.

Particle size (nm)	Number of particles	Frequency (%)
2-3	8	1.71
3-4	98	20.99
4-5	258	55.25
5-6	69	14.78
6-7	34	7.28
Total	**467**	**100.00**

Table A.9 The size distribution of CeO_2 particles prepared by CEAs method : Brij96V as a surfactant.

Particle size (nm)	Number of particles	Frequency (%)
2-3	25	5.58
3-4	104	23.21
4-5	233	52.01
5-6	57	12.72
6-7	29	6.47
Total	**448**	**100.00**

Table A.10 The size distribution of CeO_2 particles prepared by CEAs method : AOT as a surfactant.

Particle size (nm)	Number of particles	Frequency (%)
2-3	15	3.60
3-4	145	34.77
4-5	197	47.24
5-6	42	10.07
6-7	18	4.32
Total	**417**	**100.00**

Table A.11 The size distribution of CeO_2 particles prepared by CEAs method : CTAB as a surfactant.

Particle size (nm)	Number of particles	Frequency (%)
2-3	15	3.54
3-4	34	8.02
4-5	219	51.65
5-6	98	23.11
6-7	58	13.68
Total	**424**	**100.00**

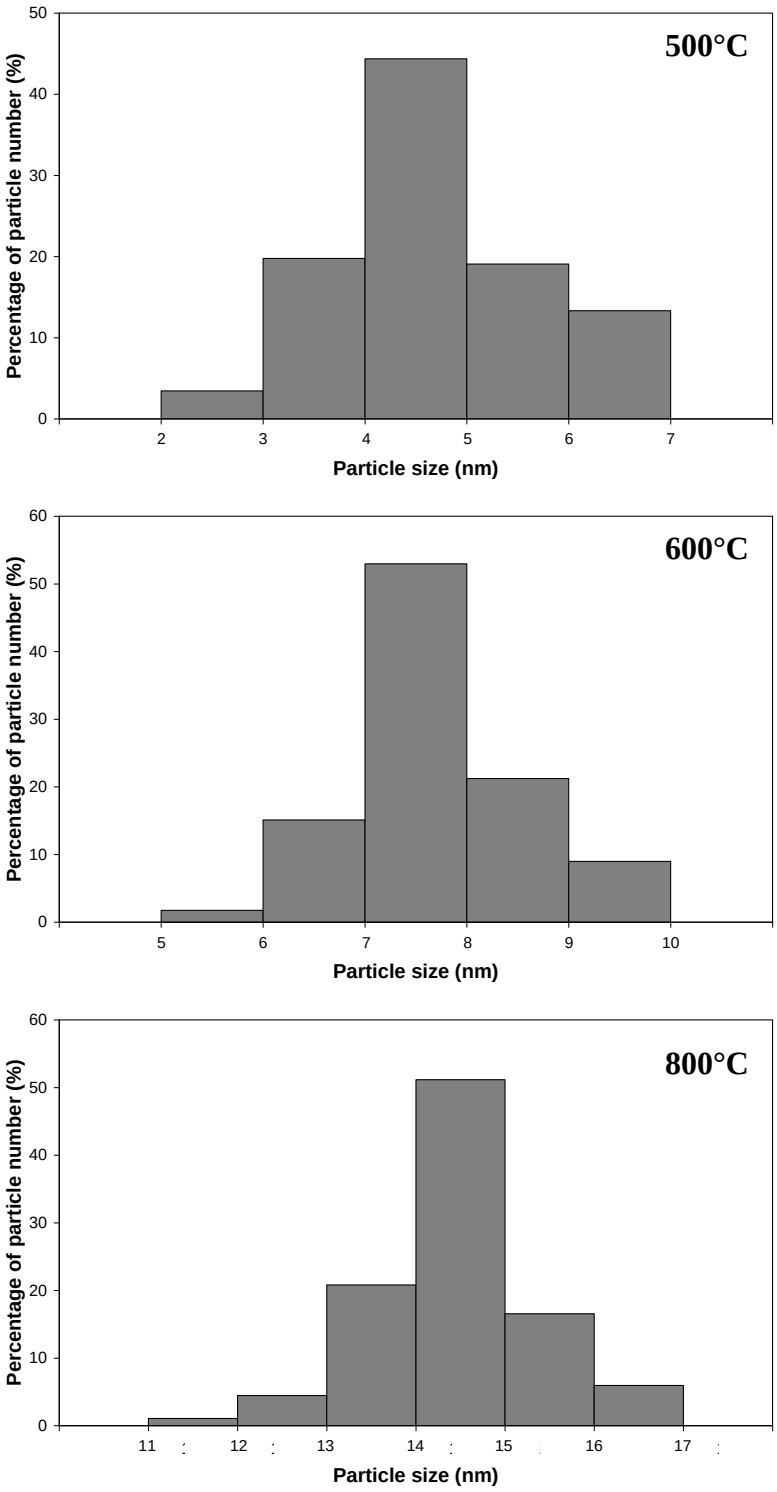

Figure A.4 The size distribution of CeO_2 prepared by different calcinations temperature.

Table A.12 The size distribution of CeO_2 particles prepared by CEAs method : calcined at 500°C.

Particle size (nm)	Number of particles	Frequency (%)
2-3	15	3.45
3-4	86	19.77
4-5	193	44.37
5-6	83	19.08
6-7	58	13.33
Total	**435**	**100.00**

Table A.13 The size distribution of CeO_2 particles prepared by CEAs method : calcined at 600°C.

Particle size (nm)	Number of particles	Frequency (%)
5-6	8	1.75
6-7	69	15.10
7-8	242	52.95
8-9	97	21.23
9-10	41	8.97
Total	**457**	**100.00**

Table A.14 The size distribution of CeO_2 particles prepared by CEAs method : calcined at 800°C.

Particle size (nm)	Number of particles	Frequency (%)
11-12	5	1.06
12-13	21	4.46
13-14	98	20.81
14-15	241	51.17
15-16	78	16.56
16-17	28	5.94
Total	**471**	**100.00**