Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Table S1. The relationship of lattice plane between *Rm* and *C*2/*m*.

Rm	*C*2/*m*	*Rm*	*C*2/*m*
(003)	(001)	(015)	(13)
(101)	(111)	(107)	(132)
(006)	(002)	(018)	(13)
(012)	(13)	(110)	(33)
(104)	(131)	(113)	(061)

Table S2. The ratio of Mn^{3+}/Mn^{4+} and Ni^{2+}/Ni^{3+} in different samples.

	Mn-2p			Ni-2p		
	Relative proportion(%)		Mn^{3+}/Mn^{4+} ratio	Relative proportion(%)		Ni^{2+}/Ni^{3+} ratio
	Mn^{3+}	Mn^{4+}		Ni^{2+}	Ni^{3+}	
CP40	13.0	87.0	0.15	100	0	-
CP45	6.9	93.1	0.07	100	0	-
CP50	0	100	0	100	0	-
CP55	0	100	0	84.6	15.6	5.42
CP60	0	100	0	79.9	20.1	3.97

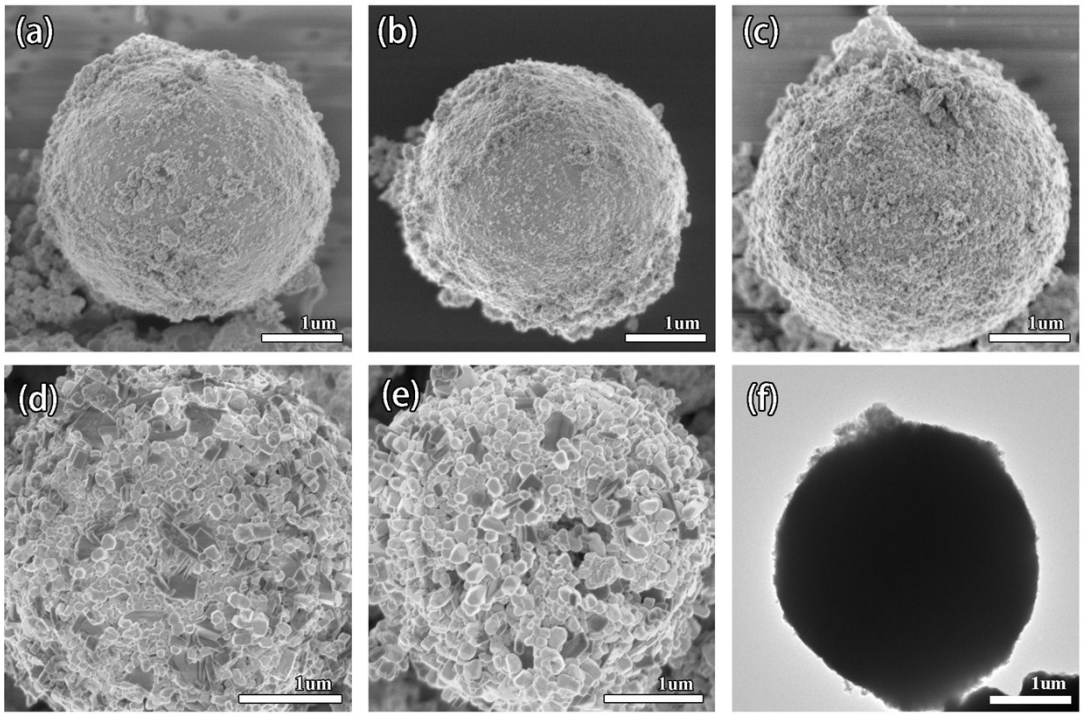

Figure S2. SEM images of a) sample CP40, b) sample CP45, c) sample CP50, d) sample CP55, e) sample CP60. (f) TEM image of sample CP50.

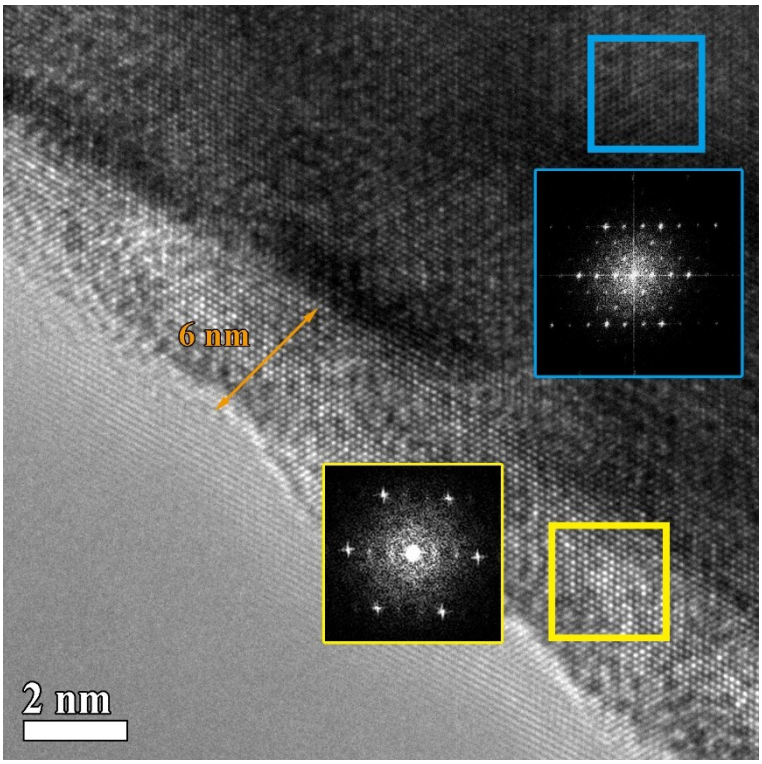

Figure S2. FFT analysis on surface layer (marked in yellow square) and interior region (marked in blue square) of sample CP55

Table S3. The Ni/Mn ratios measured by ICP-AES and XPS respectivlely.

Sample	Ni/Mn feed ratio (measured by ICP-AES)	Ni/Mn ratio at surface (measured by XPS)
CP40	**1:3.1**	**1:2**
CP45	**1:3.1**	**1:2**
CP50	**1:3.1**	**1:2**
CP55	**1:3.1**	**1:2**
CP60	**1:3.1**	**1:2**