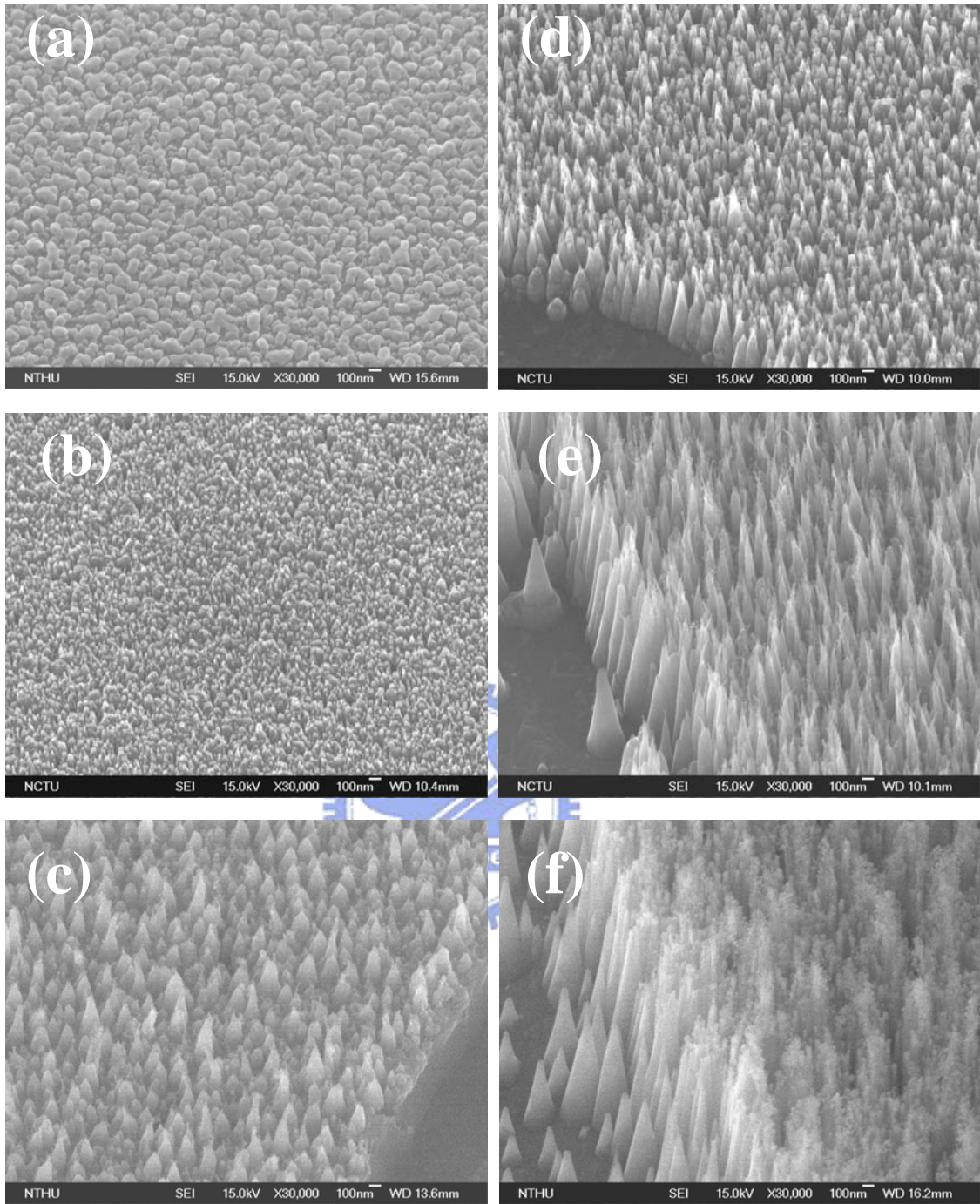


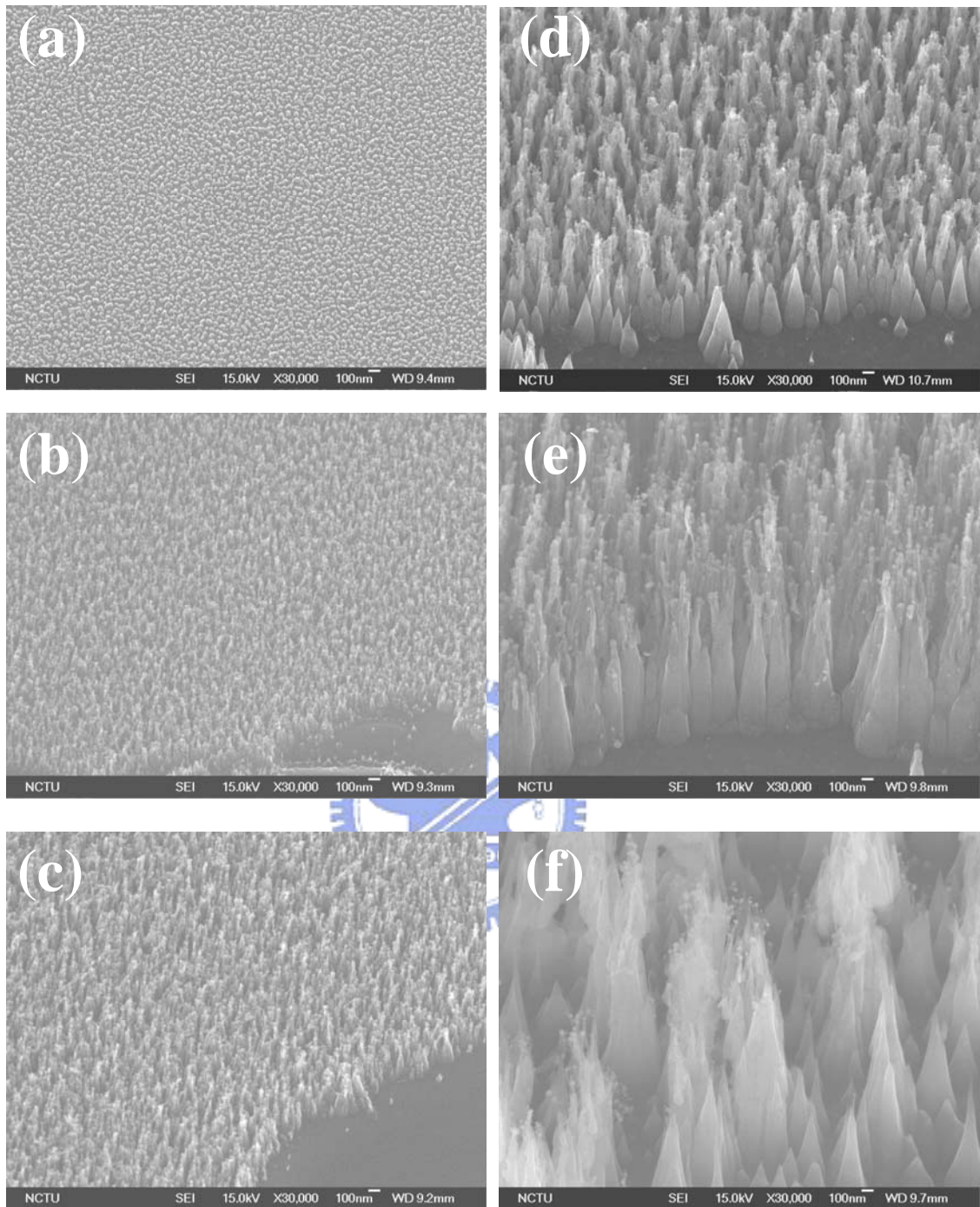
(a) Sp. A1, 1min	(d) Sp. A4, 10min
(b) Sp. A2, 3min	(e) Sp. A5, 20min
(c) Sp. A3, 5min	(f) Sp. A6, 40min

**Fig. 4-1** Effect of deposition time on SEM morphologies of the as-deposited Co-assisted nanostructures: (a) 1, (b) 3, (c) 5, (d) 10, (e) 20, and (f) 40min. for Specimens A1, A2, A3, A4, A5, and A6, respectively.



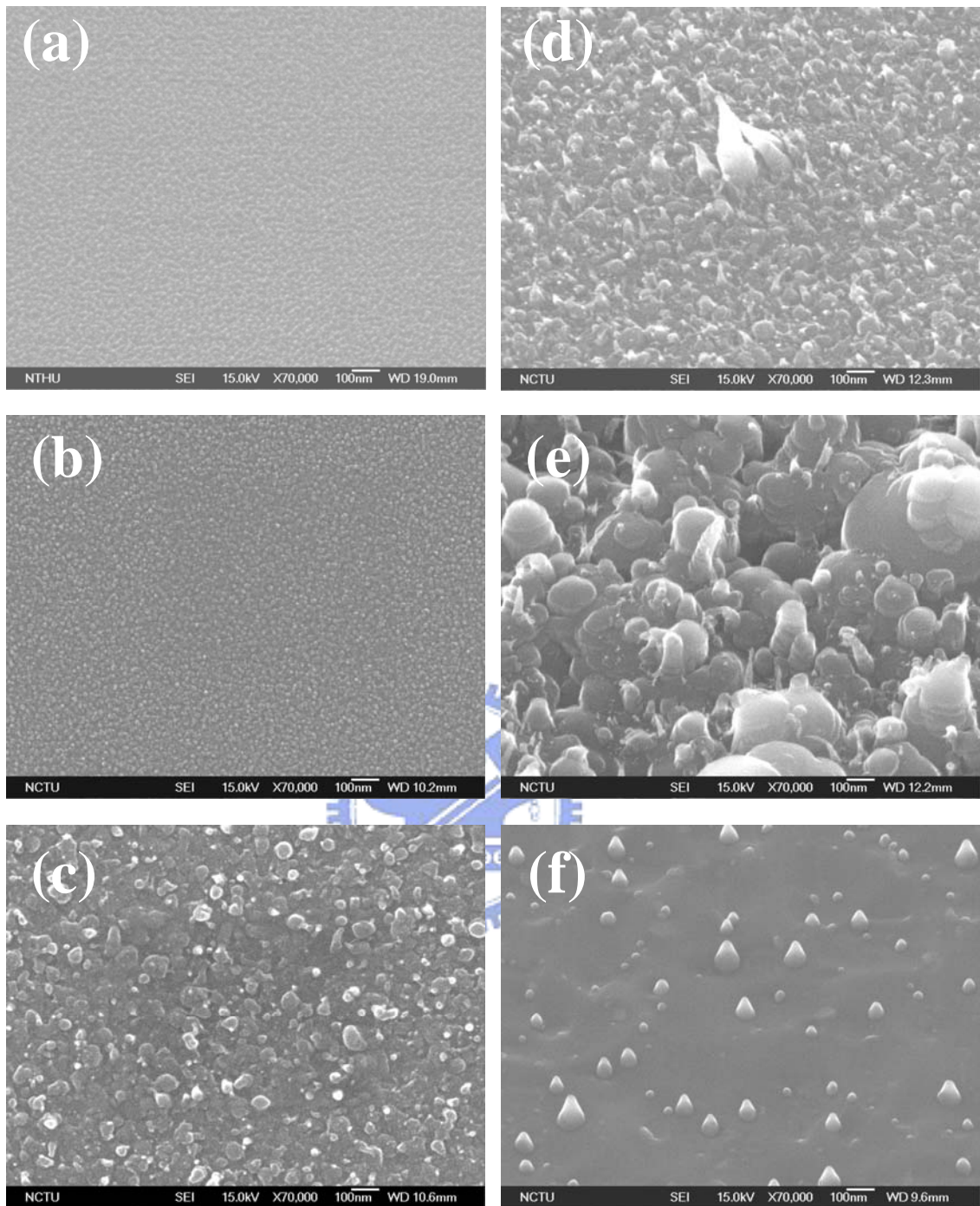
(a) Sp. B1, 1min	(d) Sp. B4, 10min
(b) Sp. B2, 3min	(e) Sp. B5, 20min
(c) Sp. B3, 5min	(f) Sp. B6, 40min

**Fig. 4-2** Effect of deposition time on SEM morphologies of the as-deposited Ni-assisted nanostructures: (a) 1, (b) 3, (c) 5, (d) 10, (e) 20, and (f) 40min. for Specimens B1, B2, B3, B4, B5, and B6, respectively.



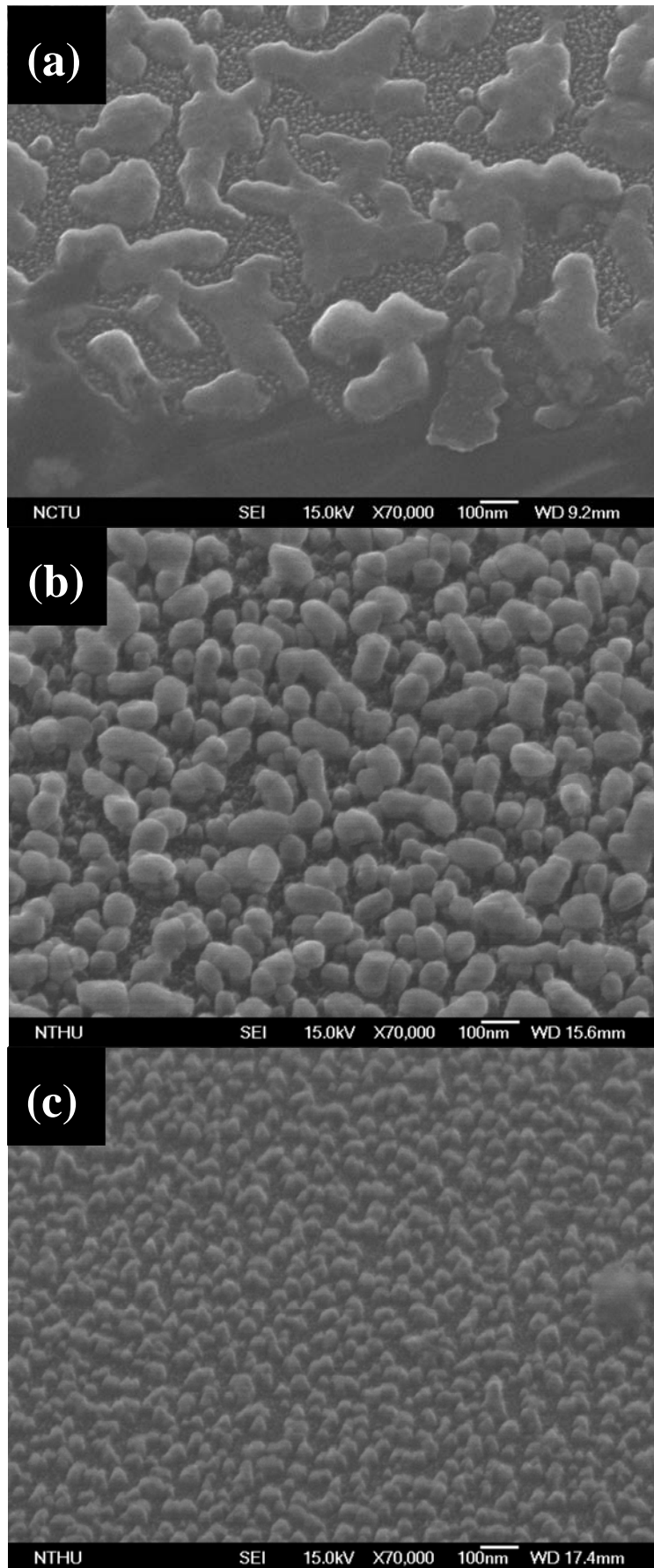
(a) Sp. C1, 1min	(d) Sp. C4, 10min
(b) Sp. C2, 3min	(e) Sp. C5, 20min
(c) Sp. C3, 5min	(f) Sp. C6, 40min

**Fig. 4-3** Effect of deposition time on SEM morphologies of the as-deposited Fe-assisted nanostructures: (a) 1, (b) 3, (c) 5, (d) 10, (e) 20, and (f) 40min. for Specimens C1, C2, C3, C4, C5, and C6, respectively.

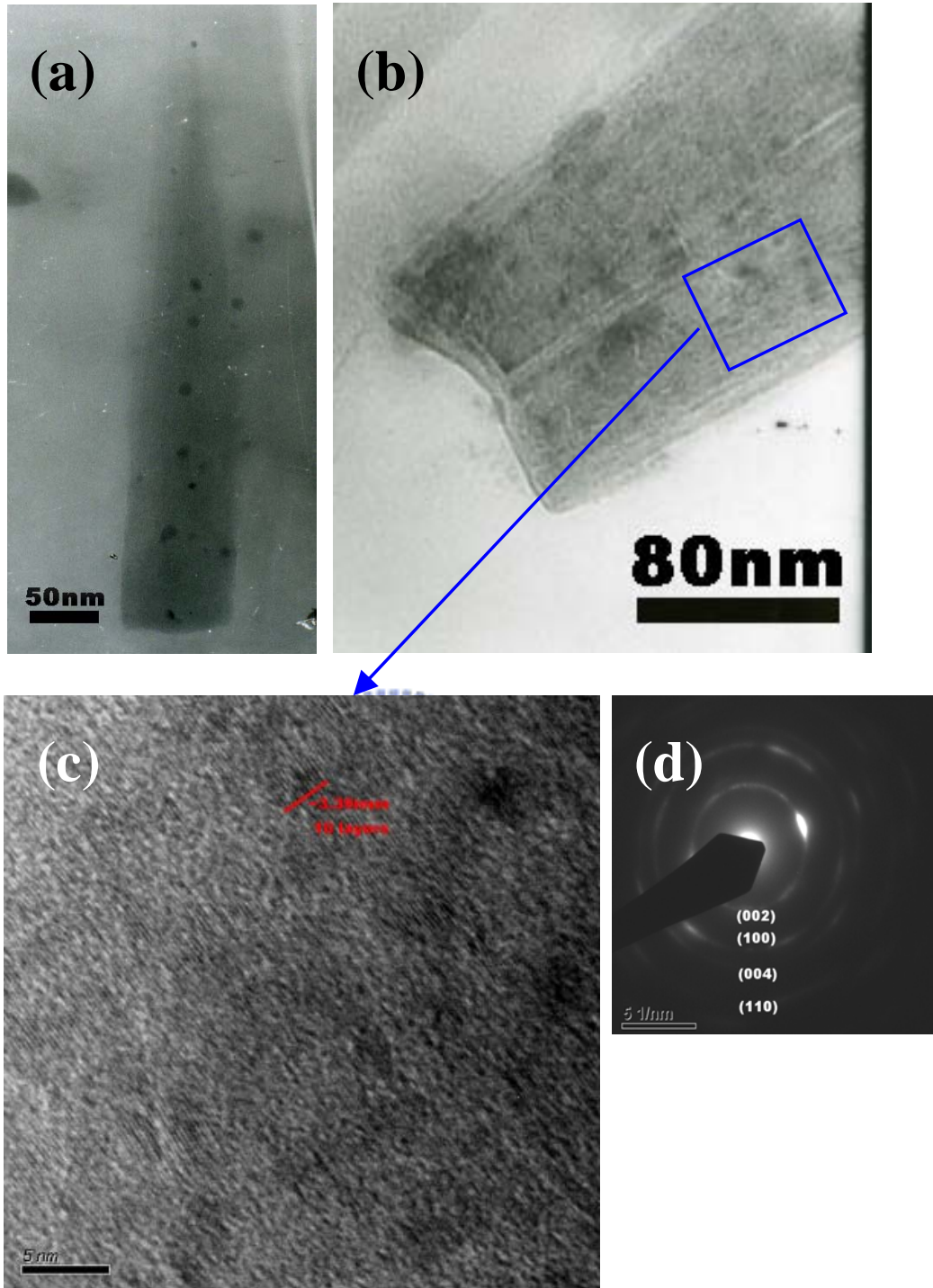


(a) Sp. D1, 1min	(d) Sp. D4, 10min
(b) Sp. D2, 3min	(e) Sp. D5, 20min
(c) Sp. D3, 5min	(f) Sp. D6, 40min

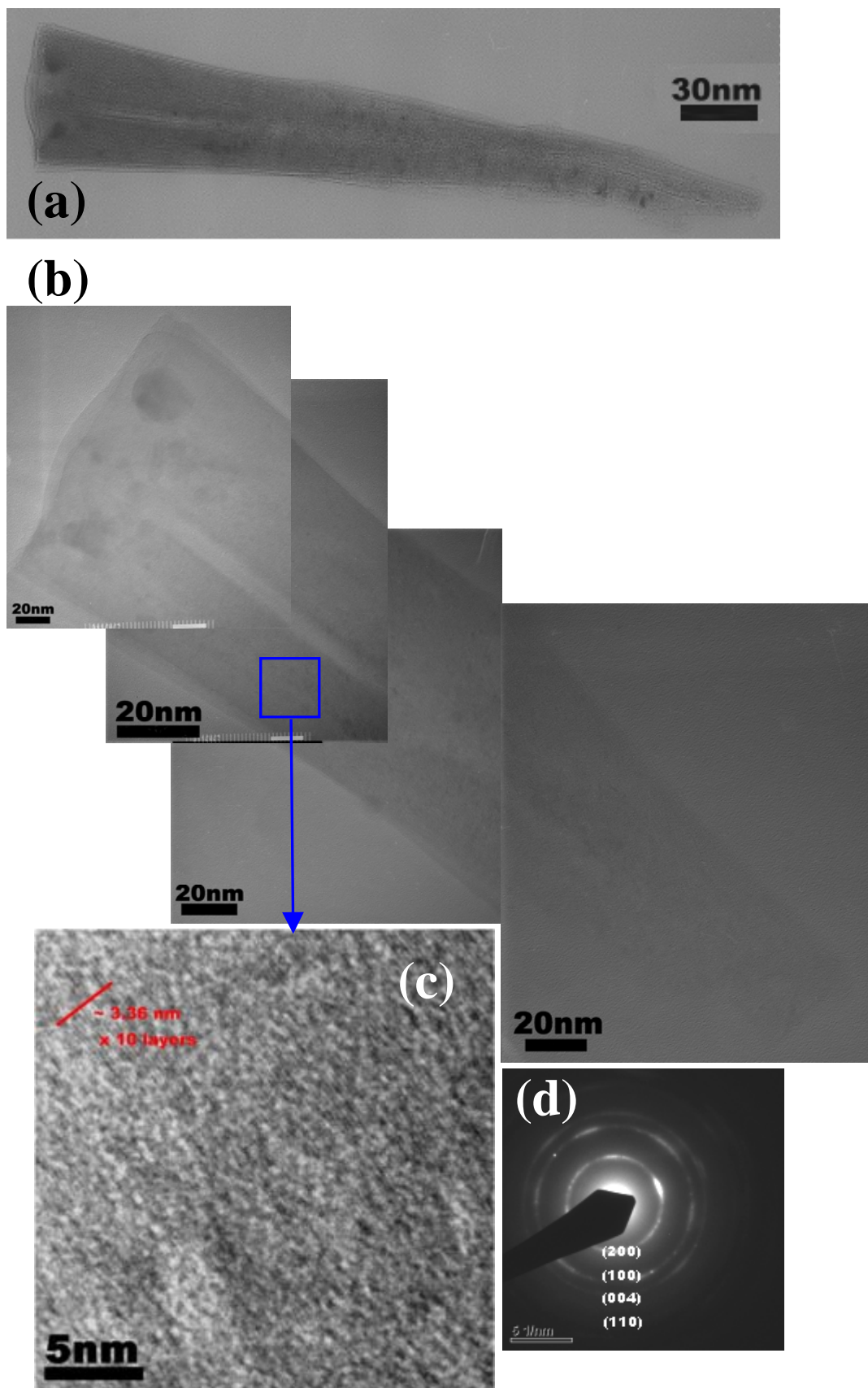
**Fig. 4-4** Effect of deposition time on SEM morphologies of the nanostructures on bare silicon wafers: (a) 1, (b) 3, (c) 5, (d) 10, (e) 20, and (f) 40min. for Specimens D1, D2, D3, D4, D5, and D6, respectively.



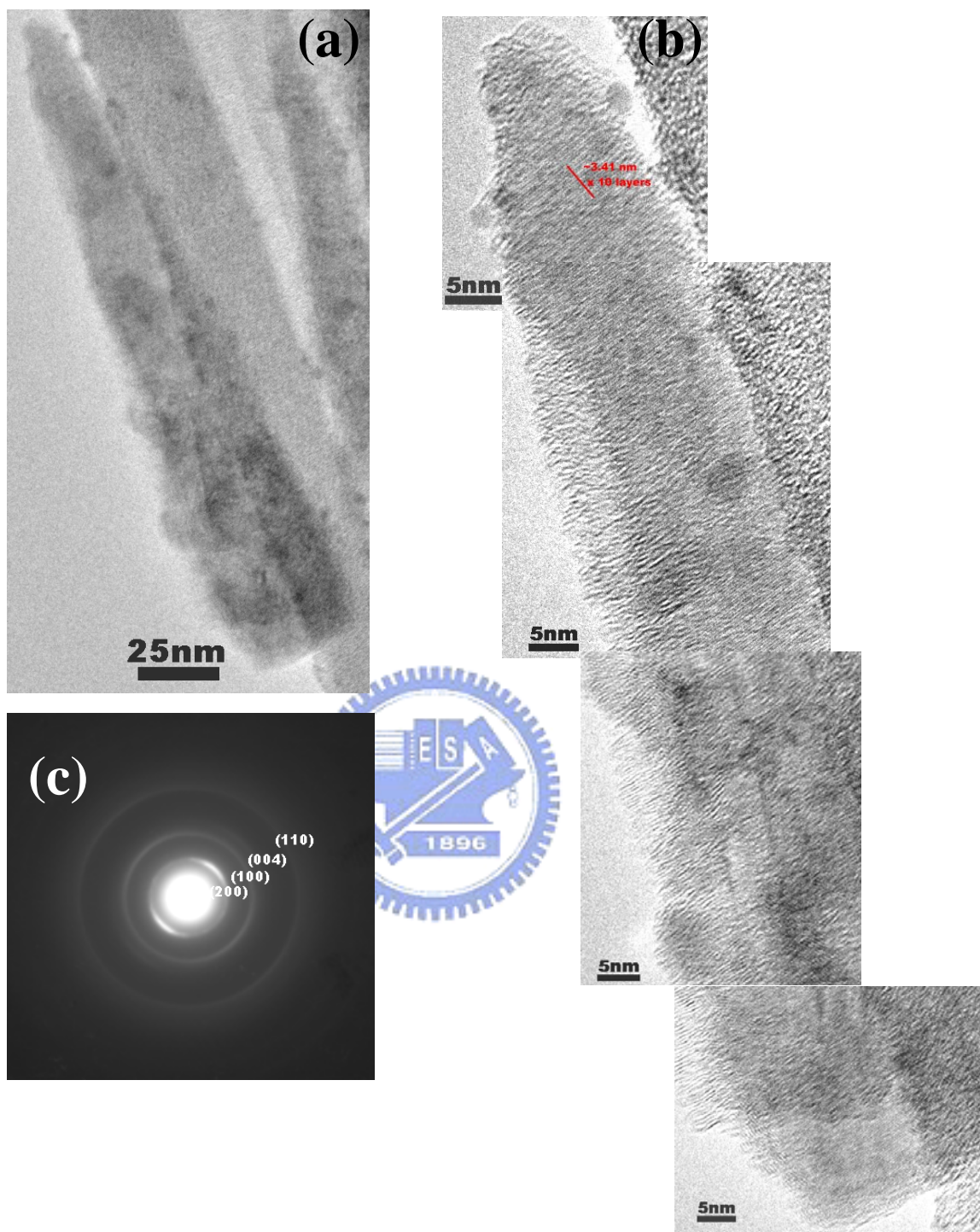
**Fig. 4-5** The high magnification SEM images of Specimens A1 (a), B1 (b), and C1(c).



**Fig. 4-6** (a) and (b) TEM images of the as-deposited Co-assisted nanostructures for Specimens A4 and A5, respectively, (c) HRTEM lattice image of (b), and (d) ED pattern of (b).

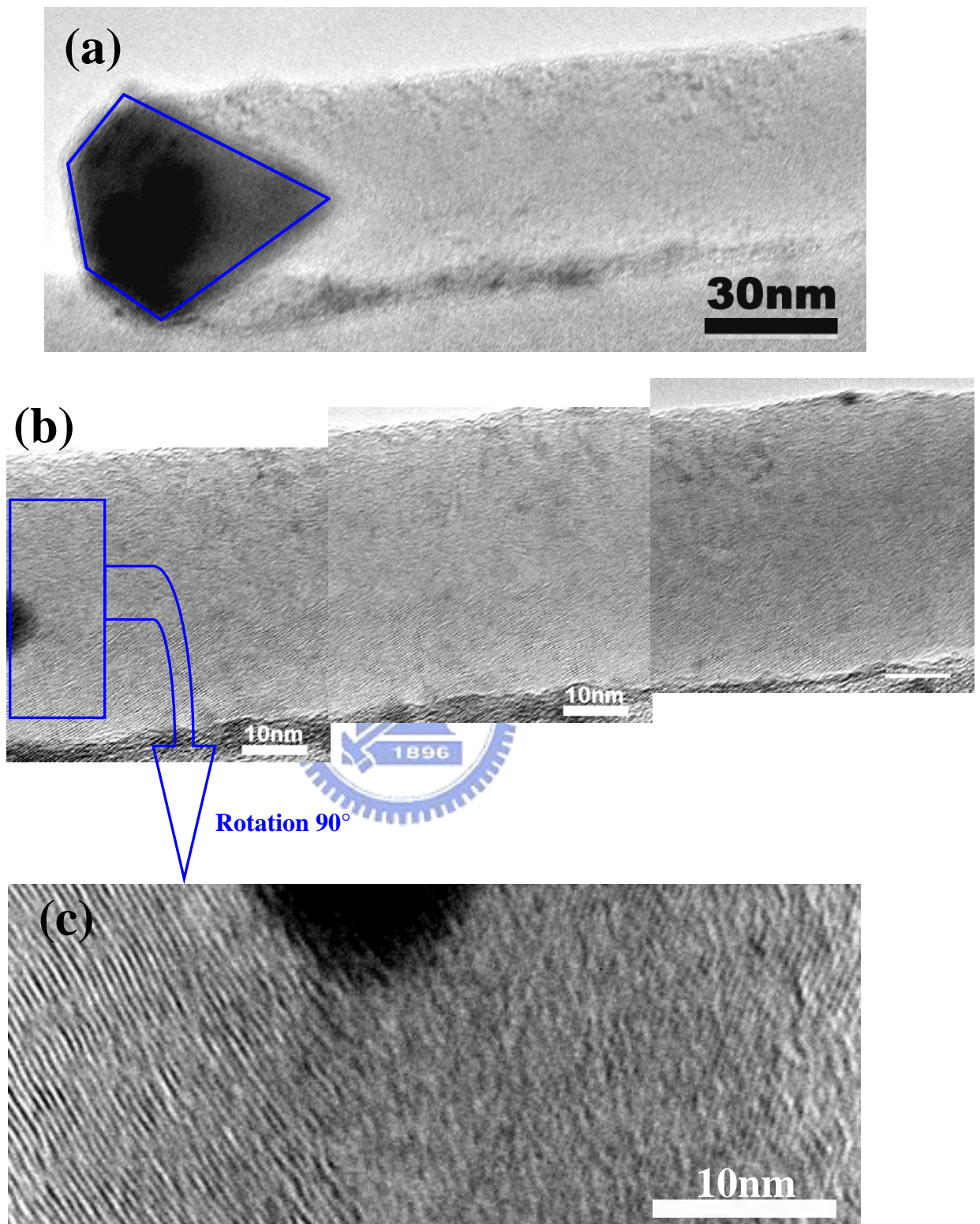


**Fig.4-7** (a) and (b) TEM images of the as-deposited Ni-assisted nanostructures for Specimen B4, (c) HRTEM lattice image of (b), and (d) ED pattern of (b).

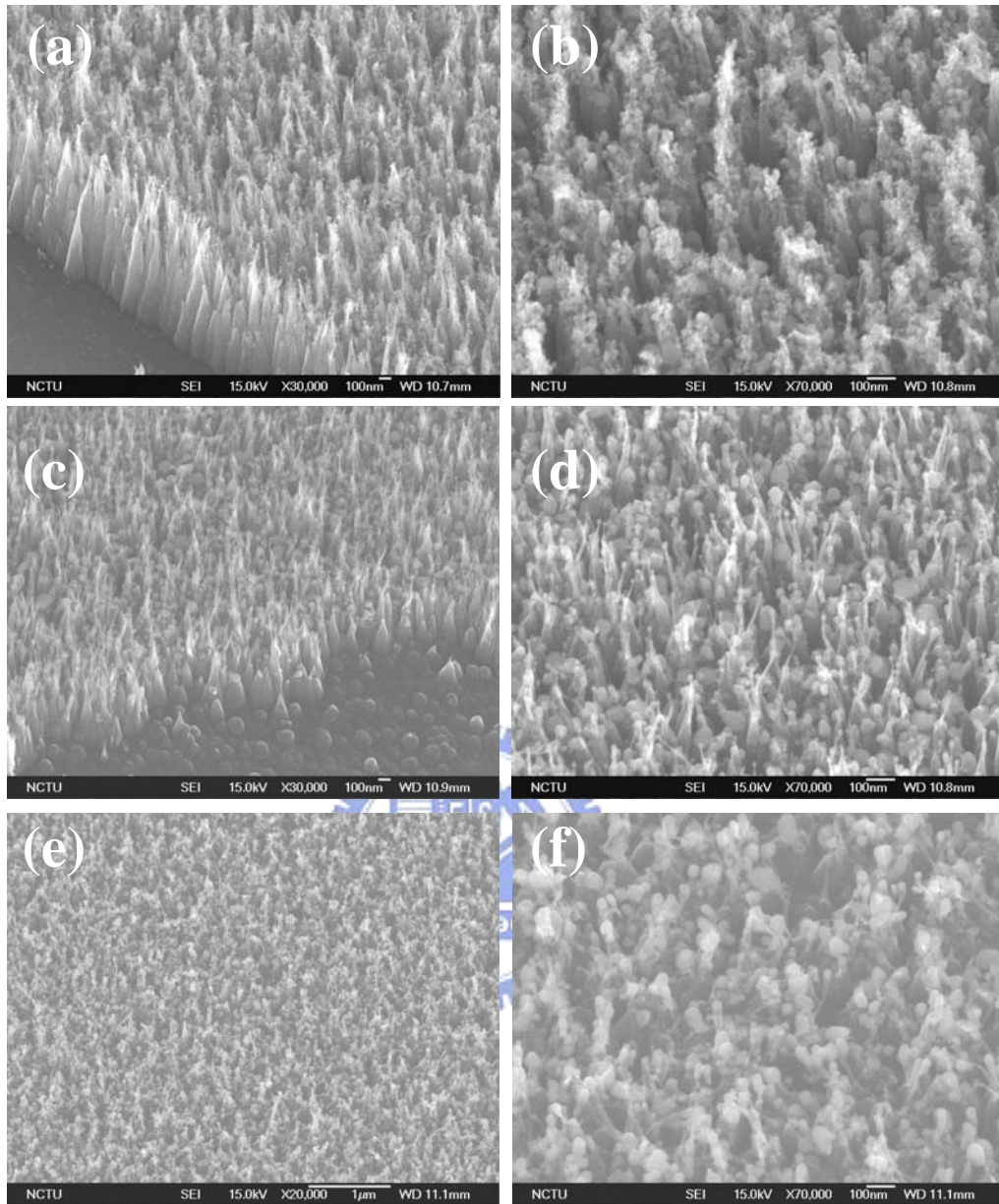


**Fig.4-8** (a) TEM image of the as-deposited Fe-assisted nanostructures for Specimen C4 , (b) HRTEM lattice images of (a), and (c) ED pattern of (a).



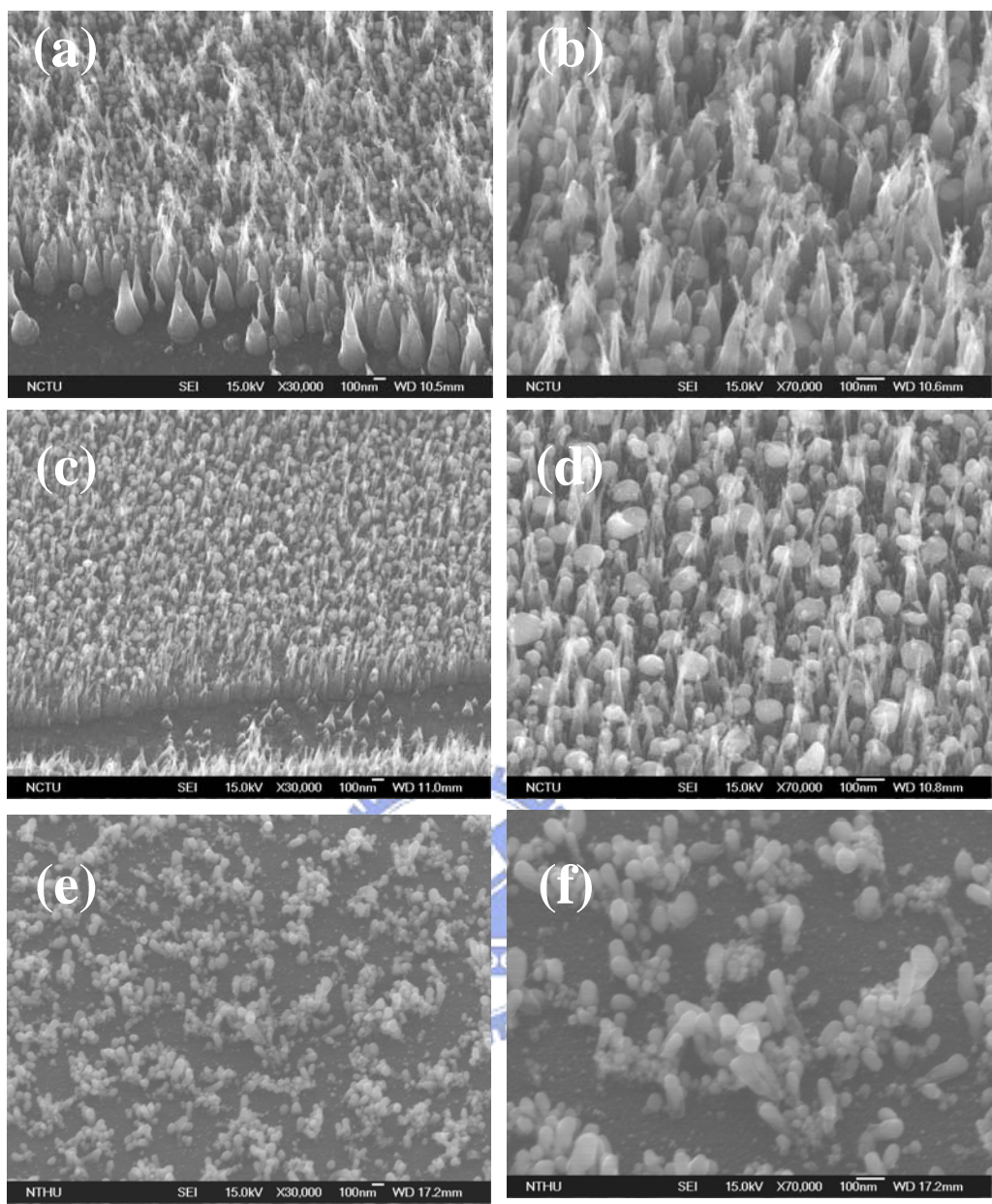


**Fig.4-9** (a) TEM image of the as-deposited branched nanostructures for Specimen C5, (b) HRTEM lattice images of (a), and (c) The high magnification HRTEM lattice image of (b).



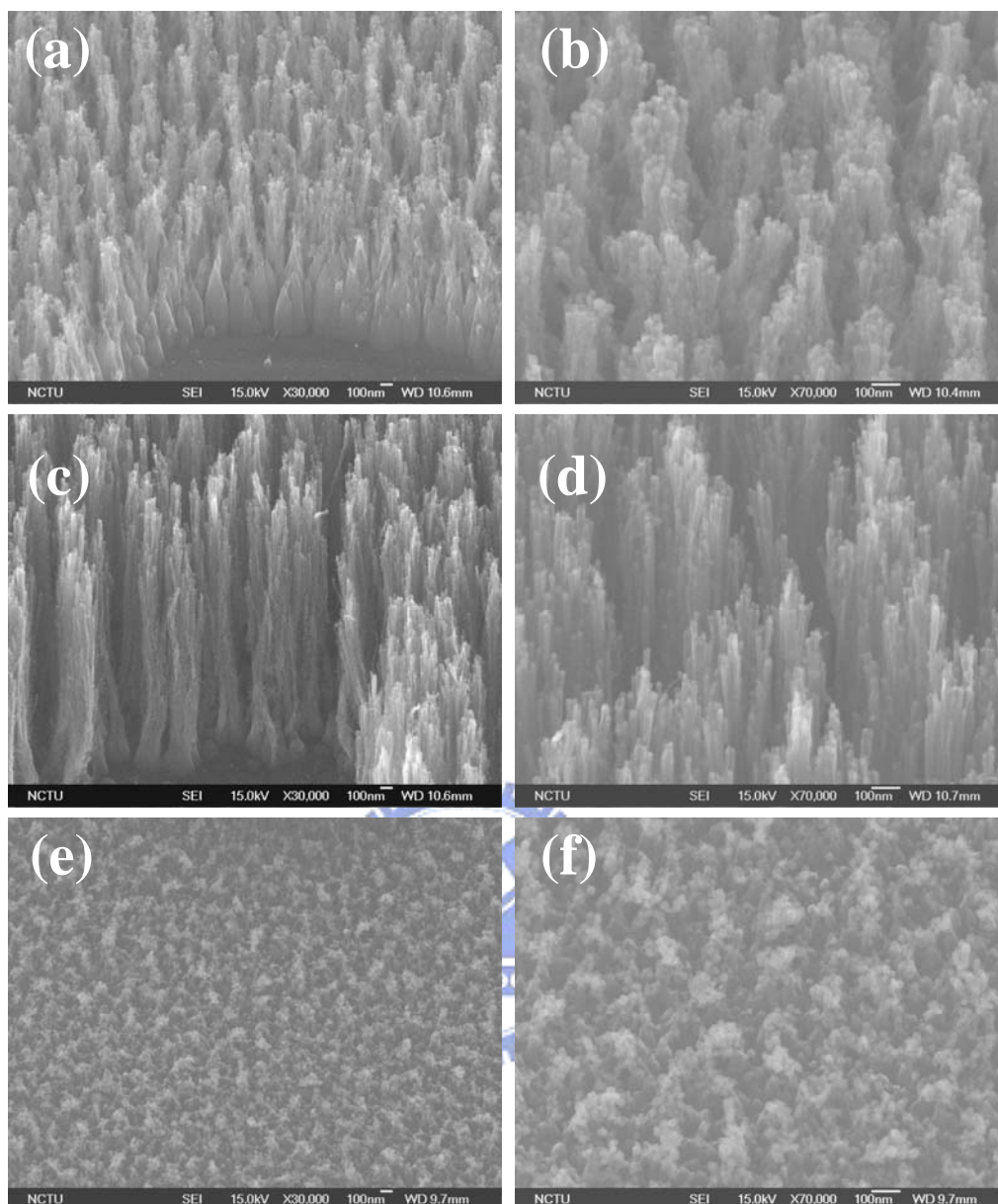
(a) Sp. A7, 16 Torr magnification 30K	(d) Sp. A7, 16 Torr magnification 70K
(b) Sp. A8, 23 Torr magnification 30K	(e) Sp. A8, 23 Torr Magnification 70K
(c) Sp. A9, 30 Torr magnification 20K	(f) Sp. A9, 30 Torr magnification 70K

**Fig. 4-10** Effect of working pressure on SEM morphologies of the as-deposited Co-assisted carbon nanostructures: (a) and (b) show Specimen A7 deposited under 16 Torr, (c) and (d) show Specimen A8 deposited under 23 Torr, (e) and (f) show Specimen A9 deposited under 30 Torr.



(a) Sp. B7, 16 Torr magnification 30K	(d) Sp. B7, 16 Torr magnification 70K
(b) Sp. B8, 23 Torr magnification 30K	(e) Sp. B8, 23 Torr magnification 70K
(c) Sp. B9, 30 Torr magnification 30K	(f) Sp. B9, 30 Torr magnification 70K

**Fig. 4-11** Effect of working pressure on SEM morphologies of the as-deposited Ni-assisted carbon nanostructures: (a) and (b) show Specimen B7 deposited under 16 Torr, (c) and (d) show Specimen B8 deposited under 23 Torr, (e) and (f) show Specimen B9 deposited under 30 Torr.



(a) Sp. C7, 16 Torr magnification 30K	(d) Sp. C7, 16 Torr magnification 70K
(b) Sp. C8, 23 Torr magnification 30K	(e) Sp. C8, 23 Torr magnification 70K
(c) Sp. C9, 30 Torr magnification 30K	(f) Sp. C9, 30 Torr magnification 70K

**Fig. 4-12** Effect of working pressure on SEM morphologies of the as-deposited Fe-assisted carbon nanostructures: (a) and (b) show Specimen C7 deposited under 16 Torr, (c) and (d) show Specimen C8 deposited under 23 Torr, (e) and (f) show Specimen C9 deposited under 30 Torr.