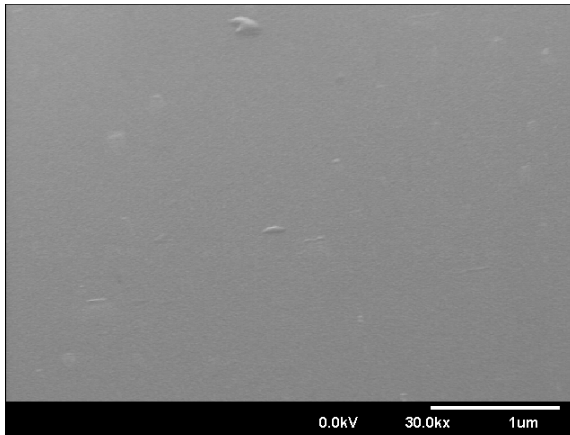
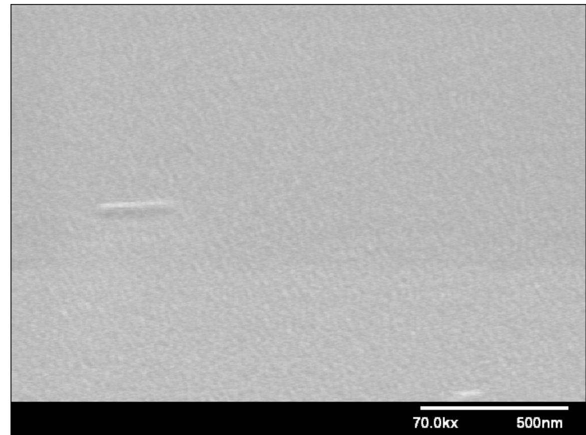
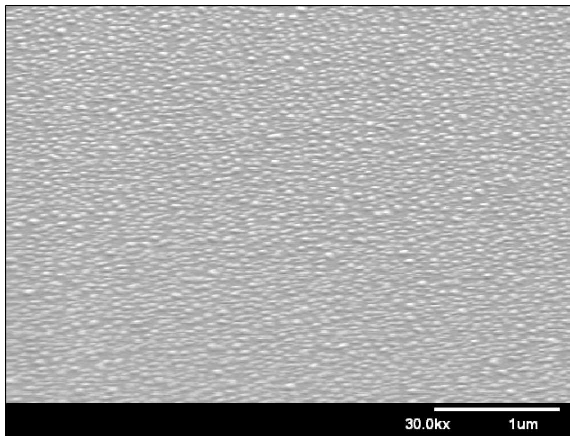
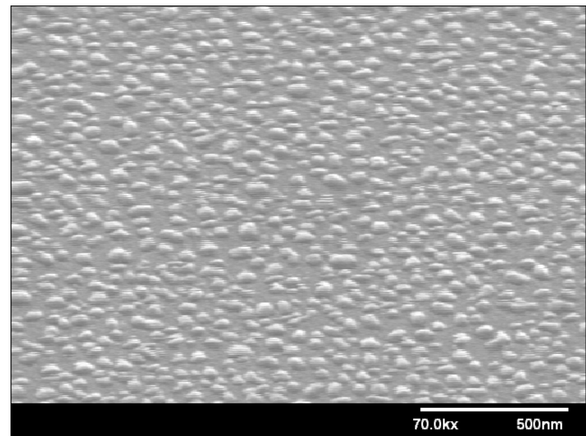
E1、600℃ H_2:200 (Ni 1 nm)



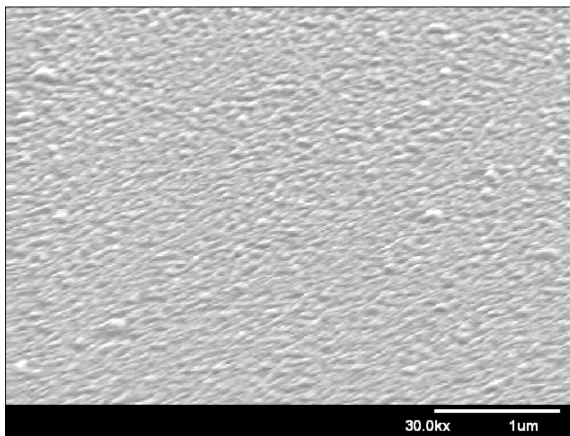


E2、600℃ H_2:200 (Ni 5 nm)





E3、600℃ H_2:200 (Ni 7 nm)



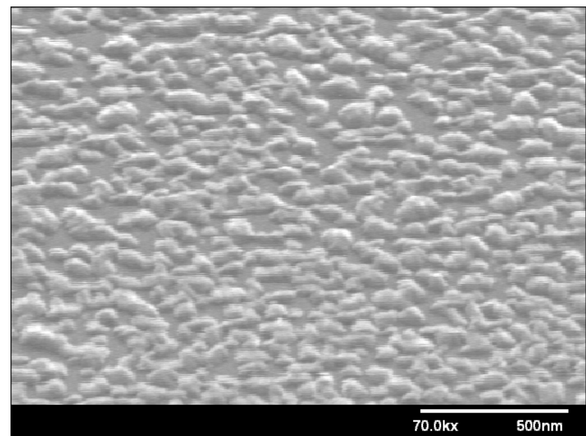
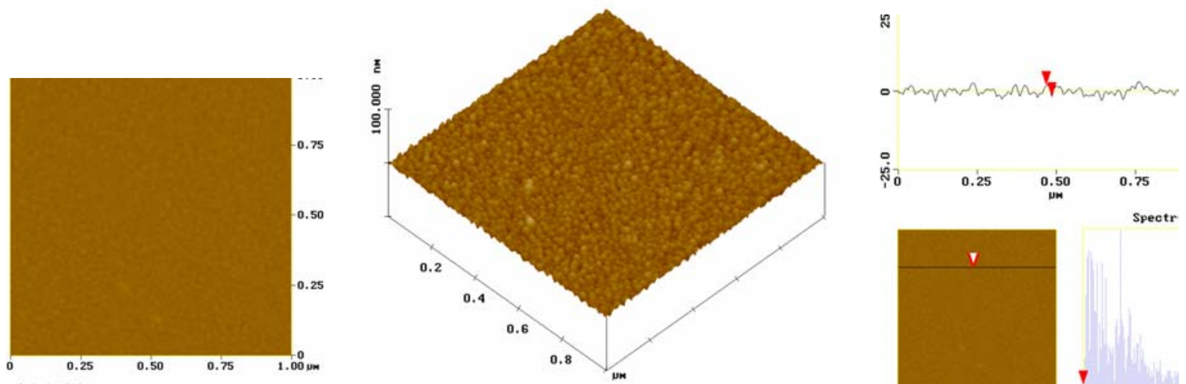
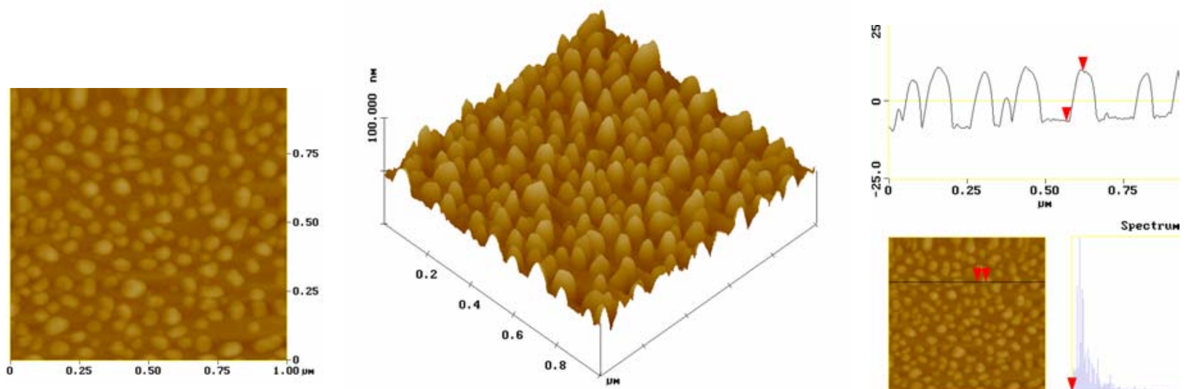


圖 4-14 製程 E 無緩衝層試件(1、2、3) SEM 圖面(30、70 kx)

E1、600℃ H_2:200 (Ni 1 nm)；Rms 1.037 nm



E2、600℃ H_2:200 (Ni 5 nm)；Rms 5.690 nm



E3、600℃ H_2:200 (Ni 7 nm)；Rms 9.175 nm

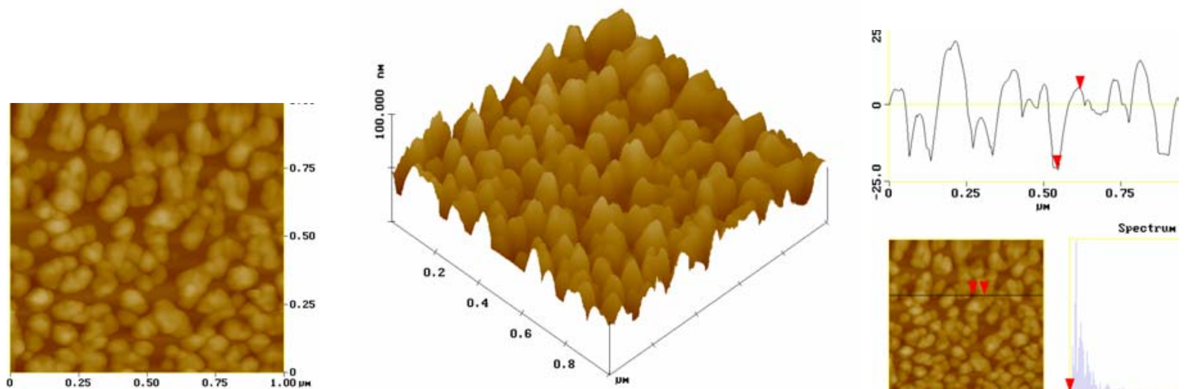
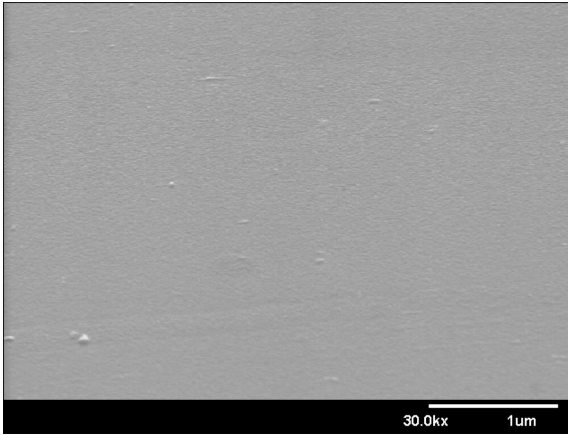
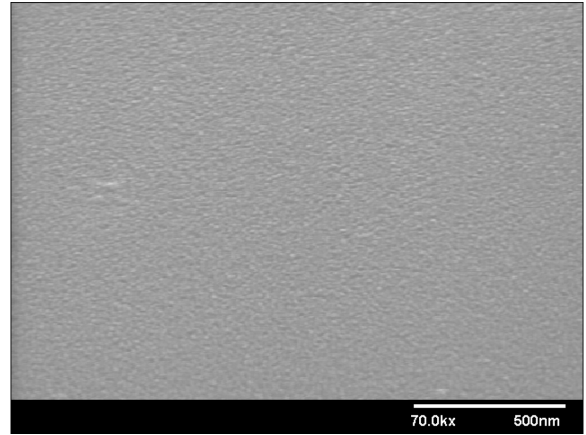


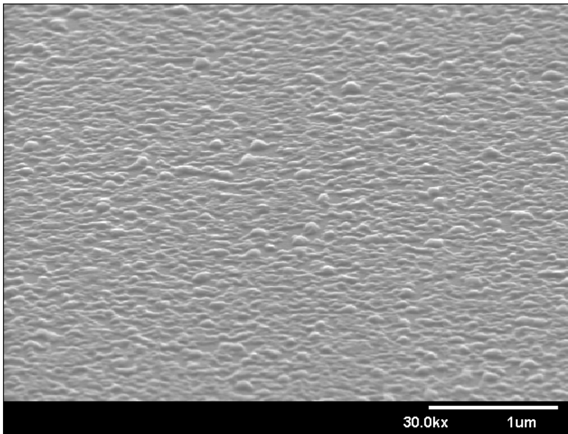
圖 4-15 製程 E 無緩衝層試件(1、2、3) AFM 圖面

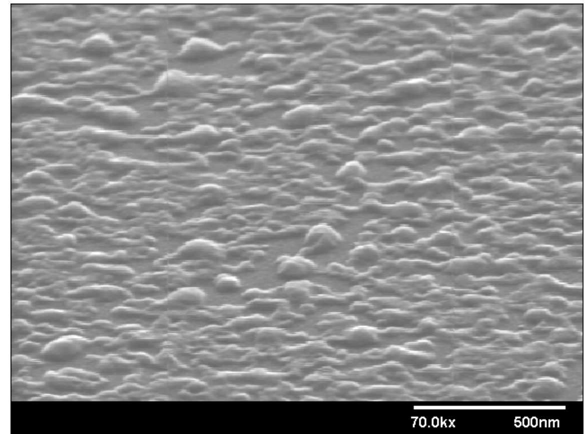
A3、550℃ H_2:100 (Ni 7 nm)



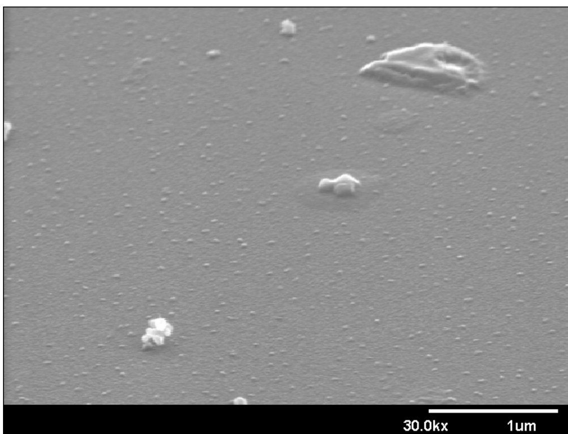


A4、550℃ H_2:100 (Ni 7 / TiN 20 nm)





A5、550℃ H_2:100 (Ni 7 / TaN 10 nm)



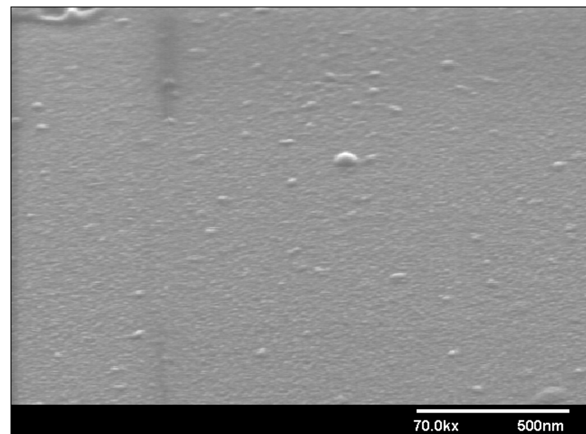
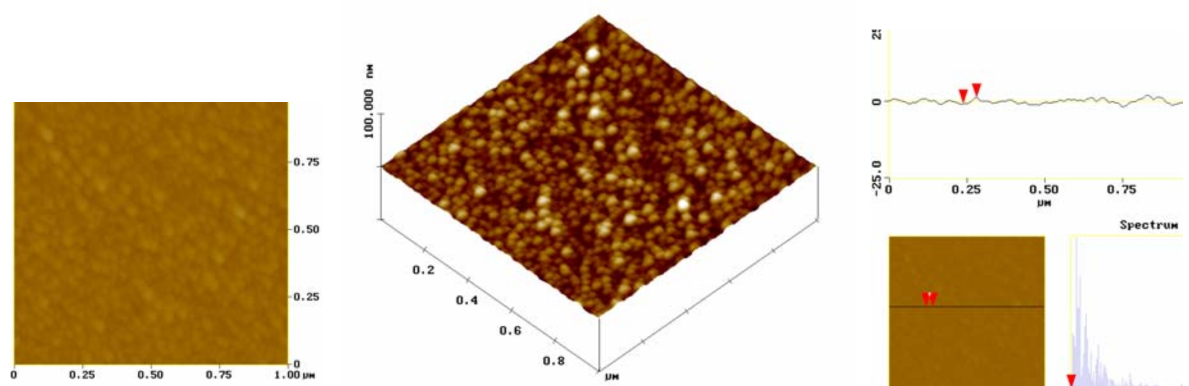
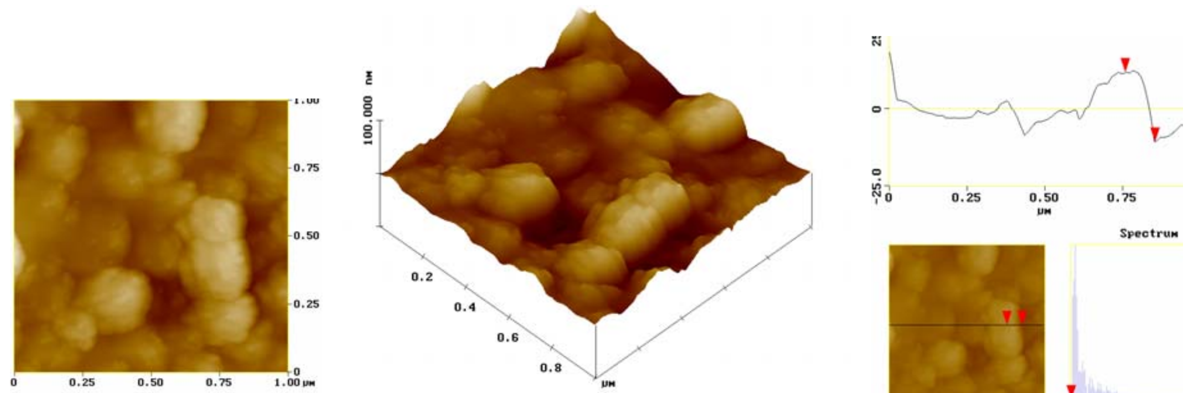


圖 4-16 製程 A 有緩衝層對照組試件(4、5) SEM 圖面(30、70 kx)

A3、550℃ H_2:100 (Ni 7 nm)；Rms 0.700 nm



A4、550℃ H_2:100 (Ni 7 / TiN 20 nm)；Rms 5.554 nm



A5、550℃ H_2:100 Ni 7 / TaN 10 nm)；Rms 4.700 nm

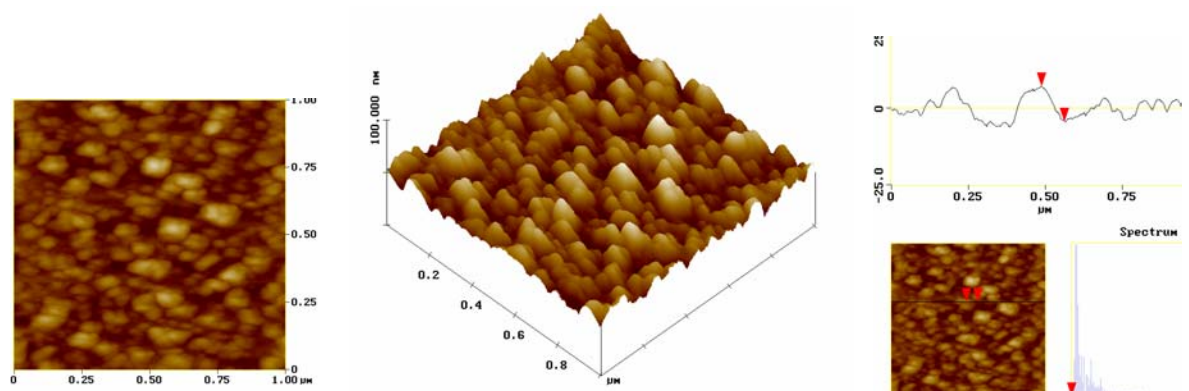


圖 4-17 製程 A 有緩衝層對照組試件(4、5) AFM 圖面