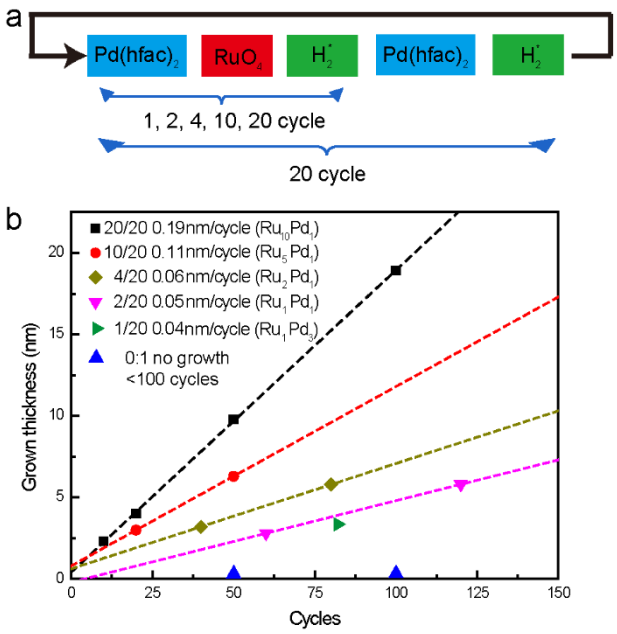

Fig. 1. Controlling the Pd content and thickness in Pd-Ru thin films. (a) ALD sequence including *m* x [$Pd(hfac)_2$ / RuO_4 / H_2* plasma] and (20-*m*) x [$Pd(hfac)_2$ / H_2* plasma], *m* = 1, 2, 4, 10, 20, (b) Sequence variation allows to control the Pd content in Pd-Ru thin films, ranging from $Ru_{10}Pd_1$ to Ru_1Pd_1 atomic stoichiometries, for which linear growth curves are obtained. In addition, while the $Pd(hfac)_2$ / H_2* process gives rise to very long incubation times (> 100 cycles), introducing a RuO_4 pulse every 20 ALD cycles, already leads to a swift nucleation of bimetallic thin film growth.

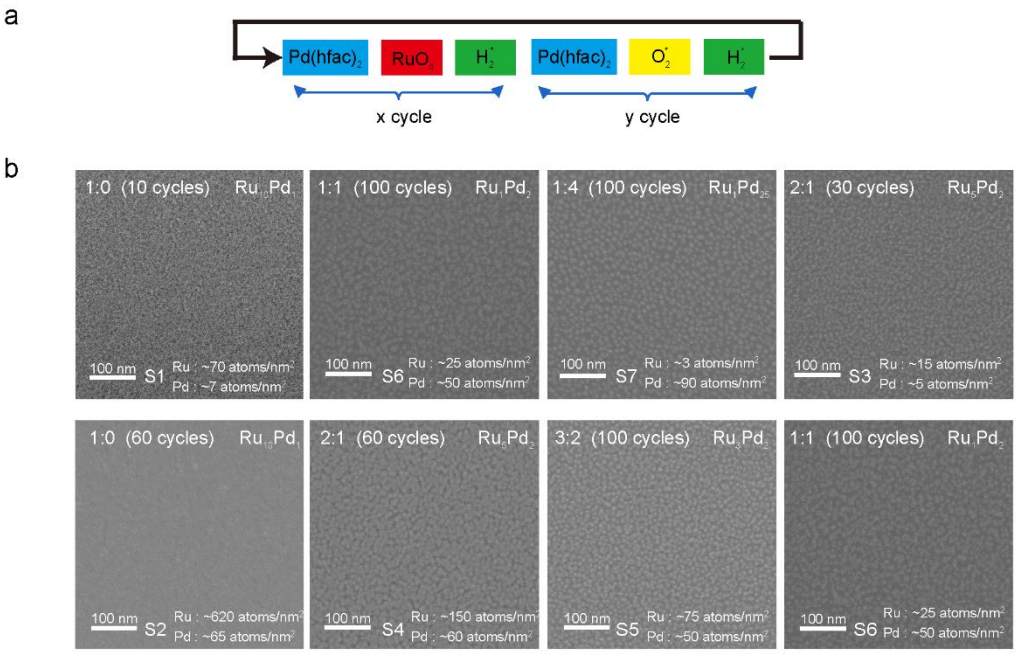

Fig. 2. (a) By replacing part of the RuO_4 units in the three-step process by O_2*, yielding *x* [$Pd(hfac)_2$ / RuO_4 / H_2* plasma] and *y* [$Pd(hfac)_2$ / O_2 / H_2* plasma] cycles, (b) the morphology of the Pd-Ru is transformed from thin films to bimetallic NPs, as observed from scanning electron microscopy (SEM) images. The top left ratios in each image corresponds to the x:y ratio in (a).