Supporting information for:

One-step chemical vapor deposition approach for solid solution $Pr_xNd_{1-x}B_6$ nanowires growth

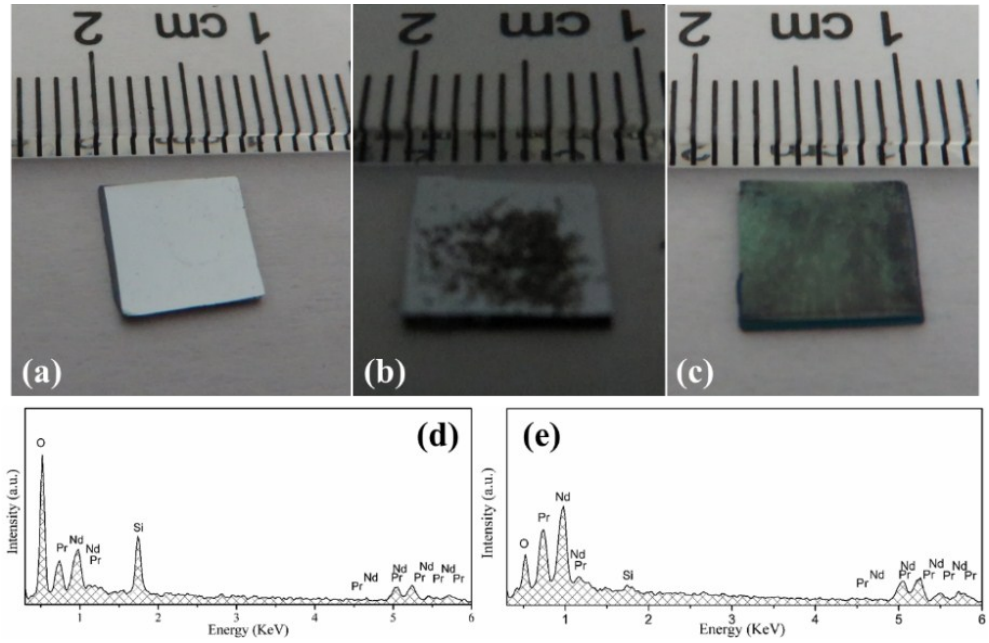

Fig. S1 (a) Si (100) substrate. (b) Pr/Nd powders distributed on Si substrate. (c) Substrate in (b) after heated to 1030ºC under 30%H_2+70%Ar atmosphere without flux of BCl_3 gas. (d) EDS acquired from the edge area of (c). (e) EDS acquired from the center of the substrate of (c).

To certify the vapor, liquid and solid phase existed during the growth period, we designed a simple experiment that Pr/Nd powders were distributed on Si wafers and were solely heated to 1030ºC for 30 min under 30%H_2+70%Ar atmosphere without flux of BCl_3 gas. The photographs are illustrated in Fig. S1 above. Apparently, the Pr/Nd powders were melted at 1030 ºC and were no longer existed as powder form according to Fig S1(c). Thus the liquid phase involved in the growth process are proved. Apart from the vapor phase of Pr/Nd, the gaseous boron phase obtained from the migration and decompose of BCl_3 gas are no doubt existed in the system. As for solid phase, the formed $Pr_xNd_{1-x}B_6$ nanowires with high melting point (referred from PrB_6 (2610 ºC) and NdB_6 (2610 ºC)) must be solid at the reaction temperature. Fig S1(d) and (e) are EDS results of the edge position and center area of the substrate of (c). The Pr/Nd signals can be obviously seen even in the edge area where the Pr/Nd powders were not distributed before, which strongly prove the vapor immigration of Pr/Nd vapor during the growth period. The easily oxidization of Pr/Nd should be the reason of O signals.