Supplementary information

Fig. 1 EDX a) from the reported SEM image b) of diamond crystall grown by using Ni NPs. A small peak due to Ni atoms is detected, the large band at about 1.75 keV come from the Si substrate.
Fig. 2 PL and Raman of CVD diamond film growth without Ni NP. The diamond Raman signal is indicated by the row.
Fig. 3 PL and Raman of CVD diamond film growth using Ni NP. The diamond Raman signal is indicated by the row.

Fig. 4 PL and Raman of CVD diamond grains growth without Ni NP. The diamond Raman signal is indicated by the row.
Fig. 5 PL and Raman of CVD diamond grains growth using Ni NP. The diamond Raman signal is indicated by the row.