

Supplementary Information

Effects of V and Gd doping on novel positive colossal electroresistance and quantum transport in PbPdO₂ thin films with (002) preferred orientation

Hai Jia^{a,c}, Liqiang Zeng^c, Wenti Guo^c, Zhiya Lin^{a,c}, Jian-Min Zhang^c, Xiaohui Huang^b, Zhigao
Huang^{c*}, and Shaoming Ying^{b*}

a College of Mathematics and Physics, Ningde Normal University, Ningde 352100, China

b Fujian Provincial Key Laboratory of Featured Materials in Biochemical Industry, College
of Chemistry and Materials, Ningde Normal University, Ningde 352100, China

c Fujian Provincial Key Laboratory of Quantum Manipulation and New Energy Materials,
College of Physics and Energy, Fujian Normal University, Fuzhou, 350117, China

*Corresponding author: E-mail:

zghuang@fjnu.edu.cn (Z. Huang);

yingshaoming@126.com (S. Ying).

1. EDS element mappings supplementary information

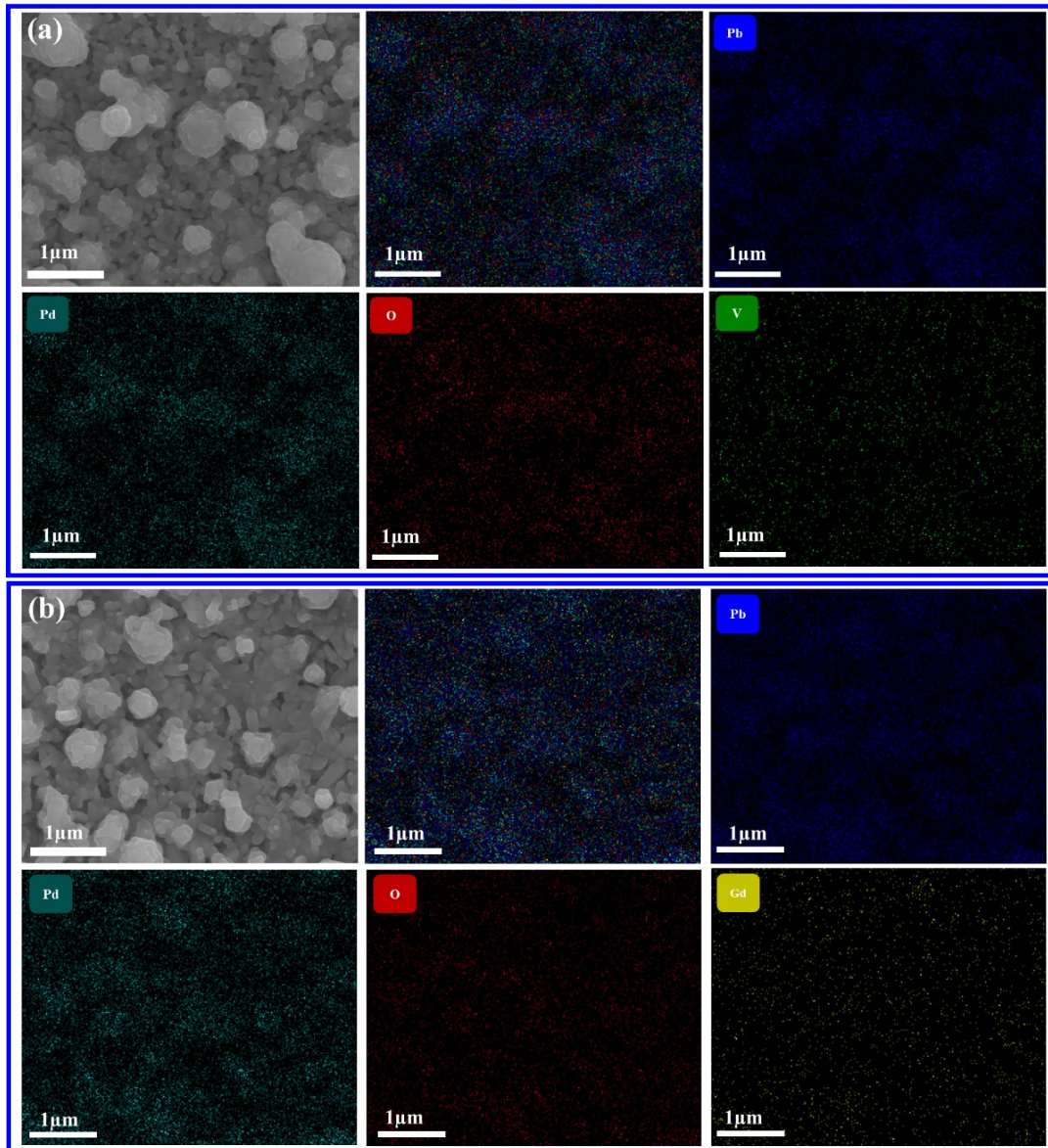


Fig.S1 EDS element mappings images of (a) PbPd_{0.9}V_{0.1}O₂ and (b) PbPd_{0.9}Gd_{0.1}O₂ thin films.

2. In-situ XPS supplementary information

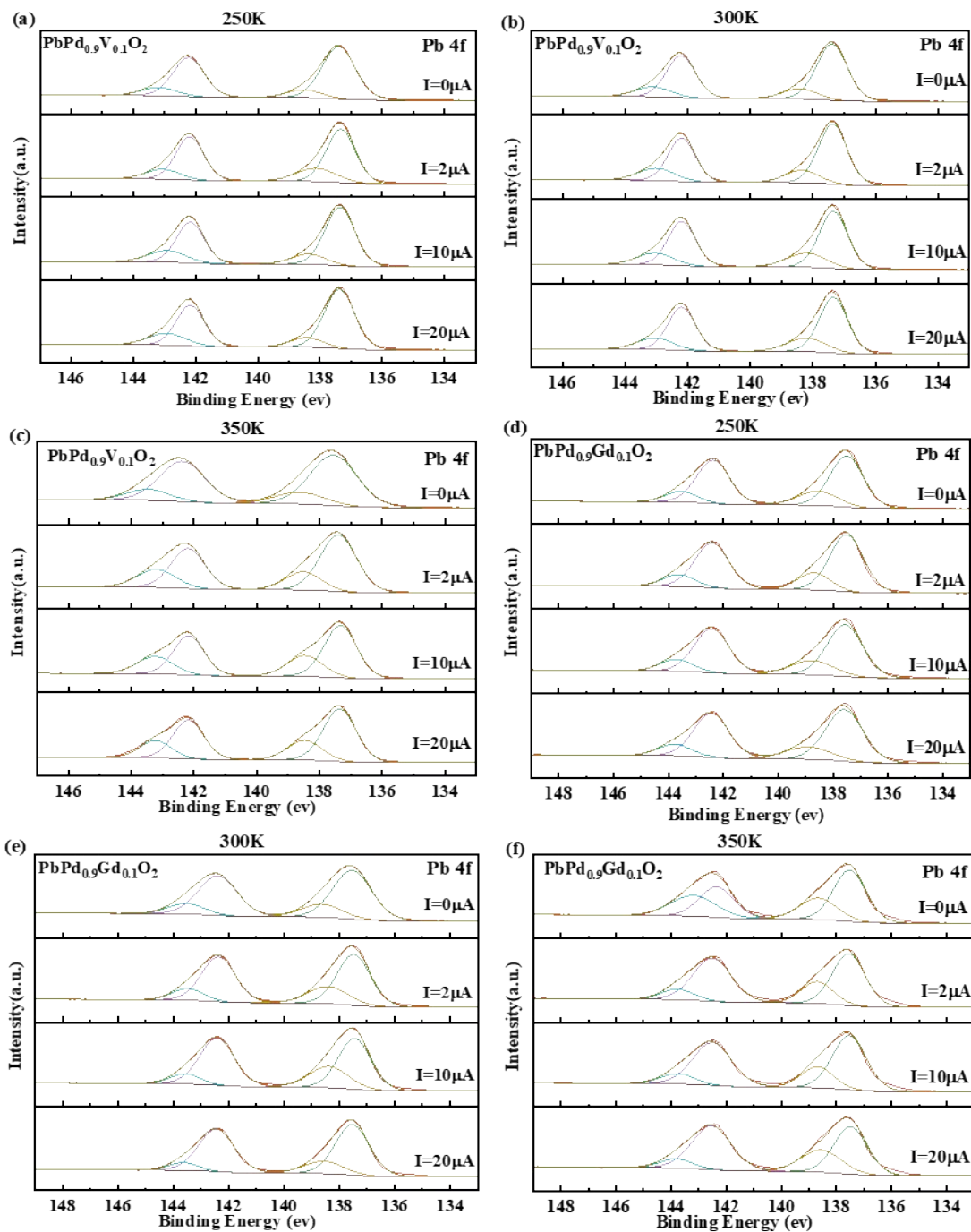


Fig. S2 (a)-(c) *In-situ* XPS of Pb 4f at $T = 250$ K, 300 K and 350 K for PbPd_{0.9}V_{0.1}O₂ thin film; (d)-(f) *In-situ* XPS of Pb 4f at $T = 250$ K, 300 K and 350 K for PbPd_{0.9}Gd_{0.1}O₂ thin film.

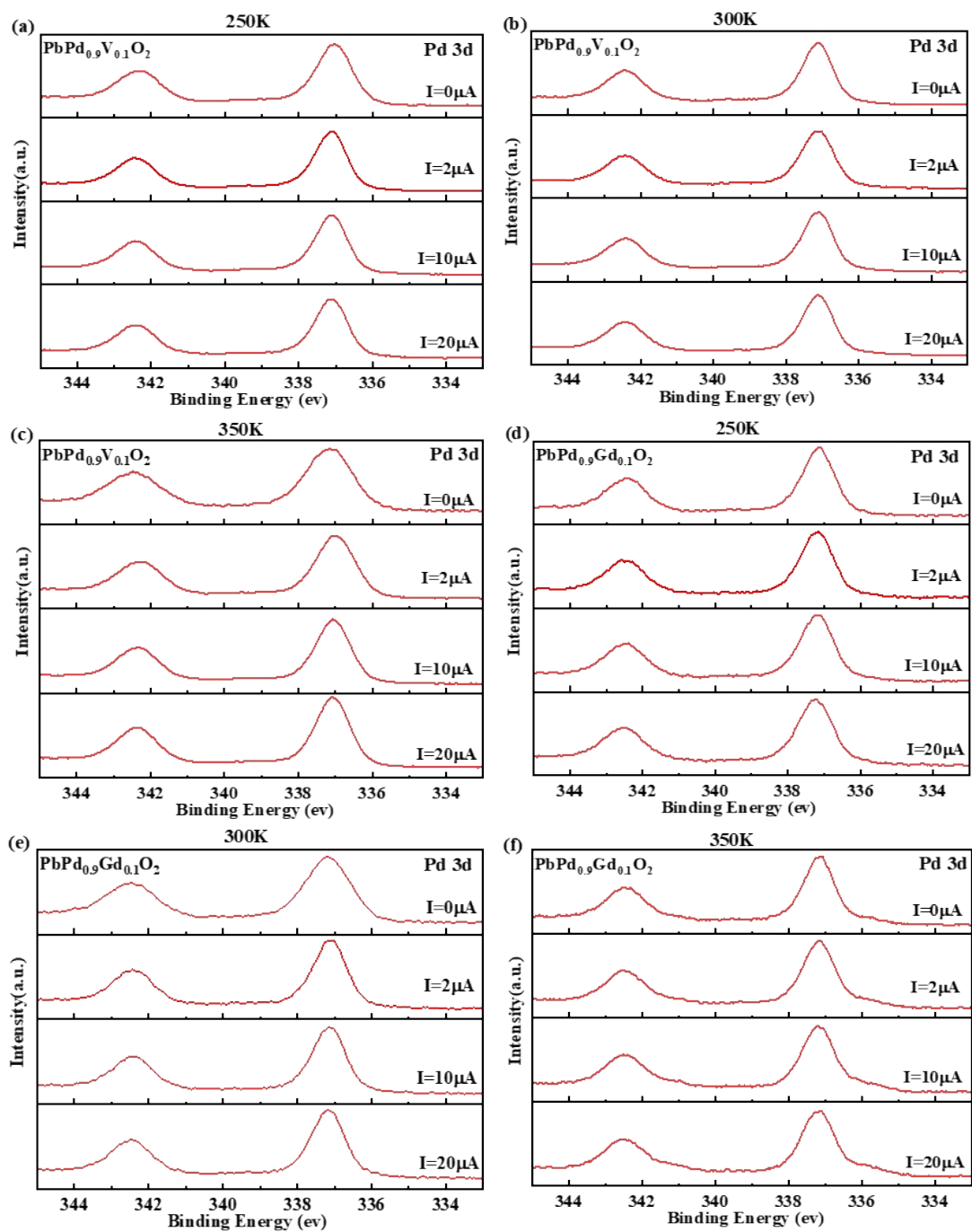


Fig. S3 (a)-(c) *In-situ* XPS of Pd 3d at $T = 250$ K, 300 K and 350 K for PbPd_{0.9}V_{0.1}O₂ thin film; (d)-(f) *In-situ* XPS of Pd 3d at $T = 250$ K, 300 K and 350 K for PbPd_{0.9}Gd_{0.1}O₂ thin film.