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Supporting Information

Dramatically Enhanced Thermoelectric Performance of MoS_2 by Introducing MoO_2 Nanoinclusions

Shuang Kong§,[ad] Tianmin Wu§,[c] Min Yuan,[ad] Zhiwei Huang,[ad] Qing-Long Meng,[a] Qike Jiang,[e] Wei Zhuang,*[b] Peng Jiang,*[ae] Xinhe Bao*[ae]

[a]State Key Laboratory of Catalysis, CAS Center for Excellence in Nanoscience, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, Liaoning 116023, China

[b]State Key Laboratory of Structural Chemistry, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou, Fujian 350002, China

[c]Department of Chemical Physics, University of Science and Technology of China, Hefei, Anhui 230026, China

[d]University of Chinese Academy of Sciences, Beijing, 100049, China

[e]Dalian National Laboratory for Clean Energy, Dalian, Liaoning 116023, China

Table S1. Carrier concentration and mobility of all the samples obtained from Hall effect measurement along both parallel and perpendicular directions.

	MoS_2-//	MoS_2(4min)-//	MoS_2(0.5h)-//	MoS_2(5h)-//	MoS_2(10h)-//
Carrier density(cm^{-3})	-3.084e+15	-1.69e+18	-2.305e+19	-2.905e+19	-3.247e+19
Mobility($cm^2 V^{-1} S^{-1}$)	1.72	12.4	4.41	4.98	5.74
	MoS_2-⊥	MoS_2(4min)-⊥	MoS_2(0.5h)-⊥	MoS_2(5h)-⊥	MoS_2(10h)-⊥
Carrier density(cm^{-3})	-2.714e+16	-1.619e+18	-1.042e+19	-1.960e+19	-2.527e+19
Mobility($cm^2 V^{-1} S^{-1}$)	2.62	16.7	8.4	10.5	10.4

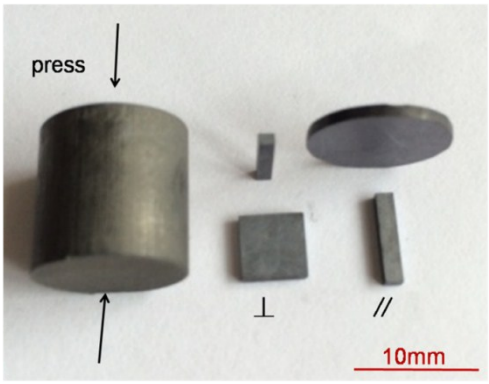

Figure S1. The cutting directions for typical samples measured in this study.

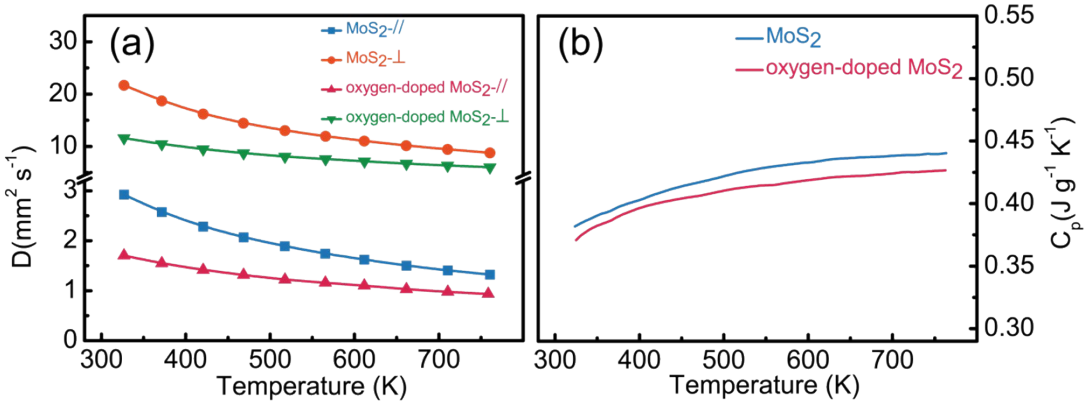

Figure S2. (a) Temperature dependence of thermal diffusivity of the pristine and the oxygen-doped MoS_2 in both directions (perpendicular and parallel to the pressing direction). (b) Specific heat capacities of the pristine and oxygen-doped MoS_2 tested by Simultaneous Thermogravimetry-Differential Scanning Calorimetry (STA 449) using a sapphire standard.

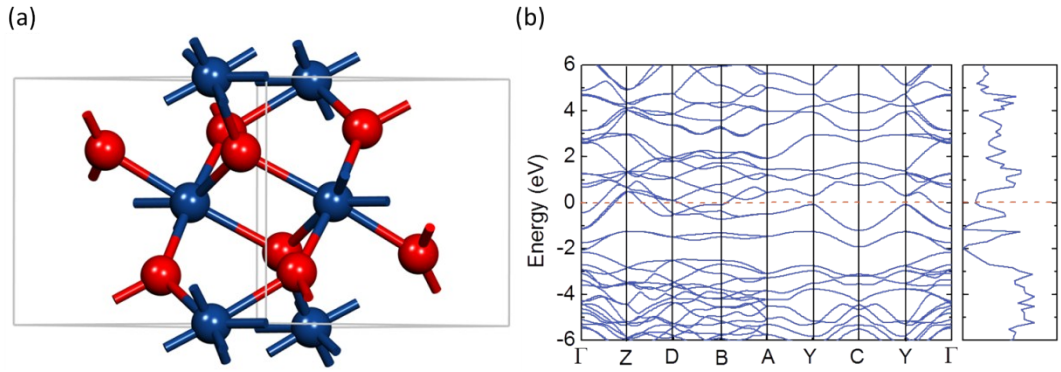

Figure S3. (a) Crystal structure of monoclinic rutile MoO_2. The Mo and O atoms are represented by dark blue and red colors, respectively. (b) Electronic band structure of MoO_2 along high-symmetry points and the corresponding density of states. The dash red line denotes the Fermi energy.

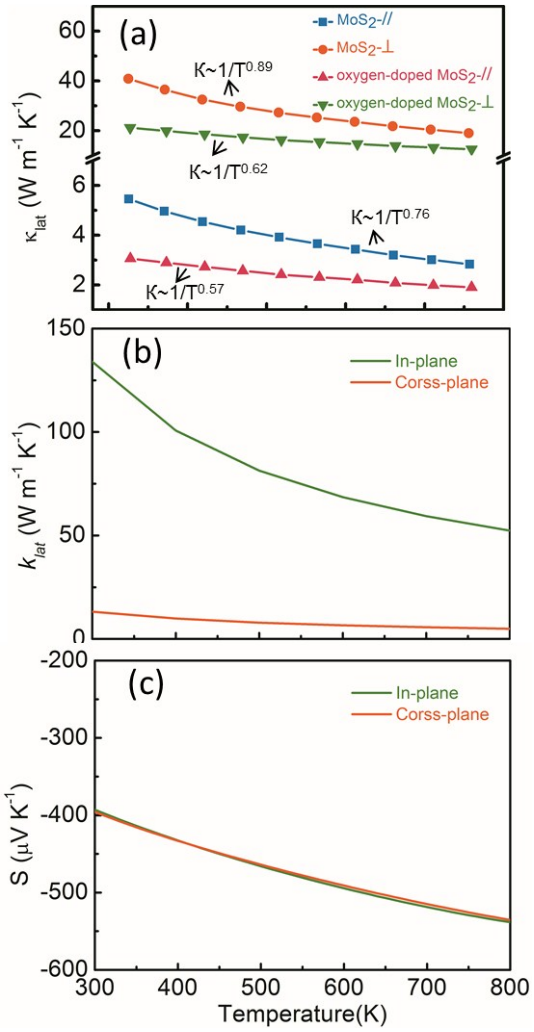

Figure S4. (a) Lattice thermal conductivity of the pristine and oxygen-doped MoS_2 samples and the fitting parameters. Calculated temperature dependence of in-plane and cross-plane (b) lattice thermal conductivity and (c) Seebeck coefficient at n-type doping concentration 10^{19} cm^{-3} of the pristine bulk MoS_2.

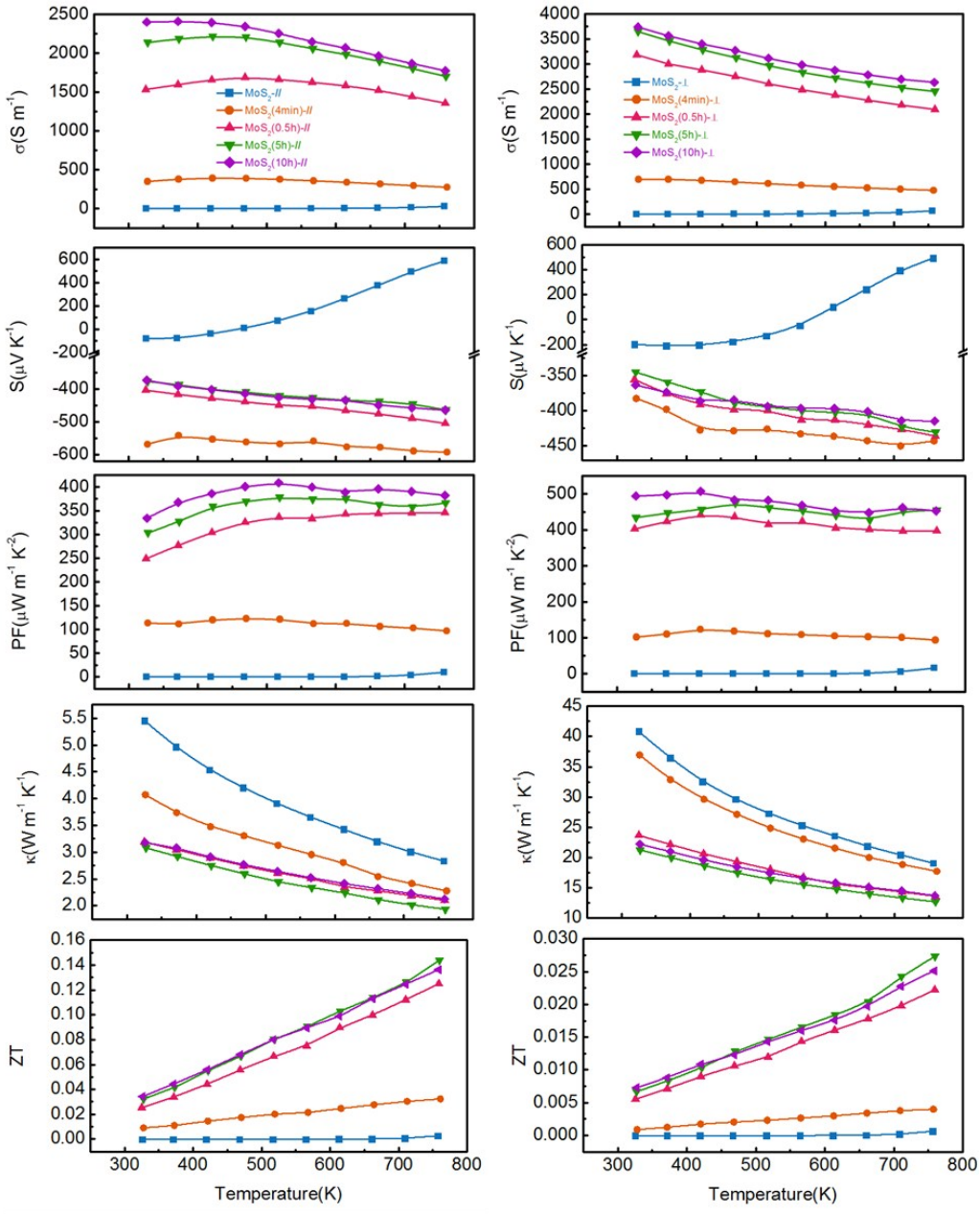

Figure S5. Temperature dependence of thermoelectric properties of all the samples along the parallel direction (left column) and the perpendicular direction (right column).

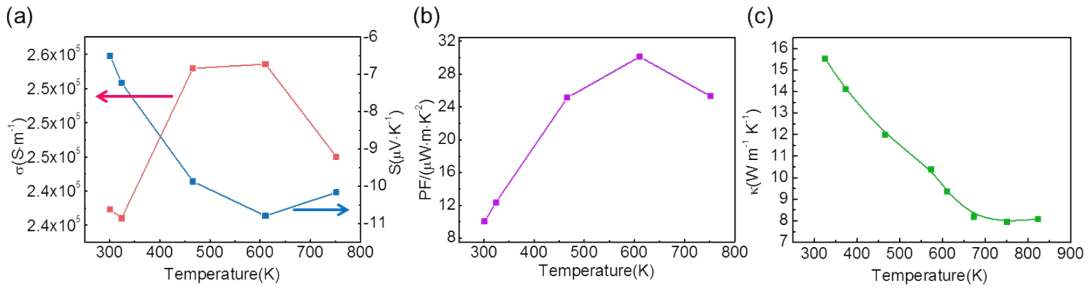

Figure S6. (a) The electrical conductivity and Seebeck coefficient of pure MoO_2. The power factor (b) and thermal conductivity (c) of pure MoO_2.