

Supplemental Information for:

Oxygen reduction on bimodal nanoporous palladium-copper catalyst

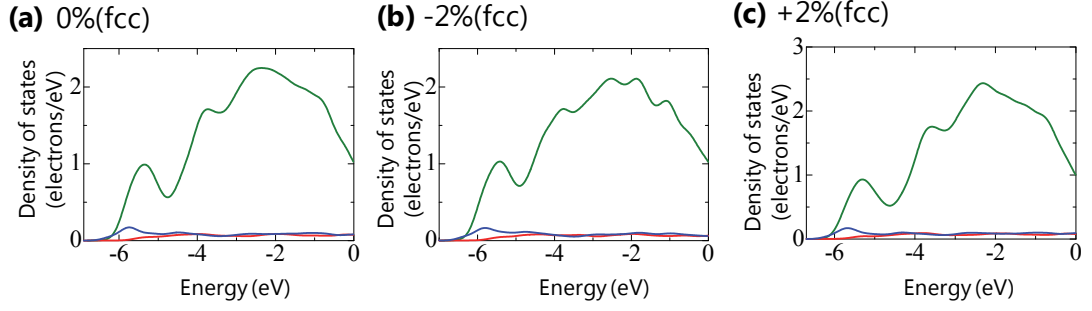
synthesized using sacrificial nanoporous copper

Naoki Miyazawa, Masataka Hakamada*, Yuto Sato and Mamoru Mabuchi

Department of Energy Science and Technology, Graduate School of Energy Science, Kyoto University,
Yoshidahonmachi, Sakyo, 606-8501 Kyoto, Japan

* Corresponding author. E-mail: hakamada.masataka.3x@kyoto-u.ac.jp (M. Hakamada).

skin



Cu

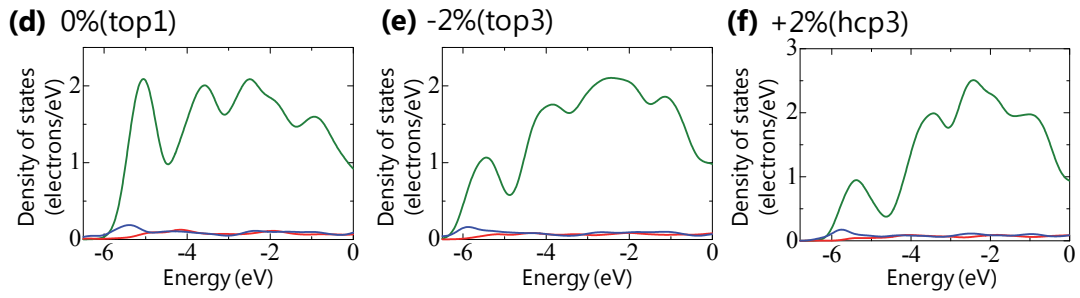


FIG. S1. Densities of states (DOS) for a palladium atom binding to an oxygen atom, (a) Pd surface with 0% strain, (b) Pd surface with 2% contraction strain, (c) Pd surface with 2% expansion strain, (d) Pd-Cu surface with 0% strain, (e) Pd-Cu surface with 2% contraction strain and (f) Pd-Cu surface with 2% expansion strain.

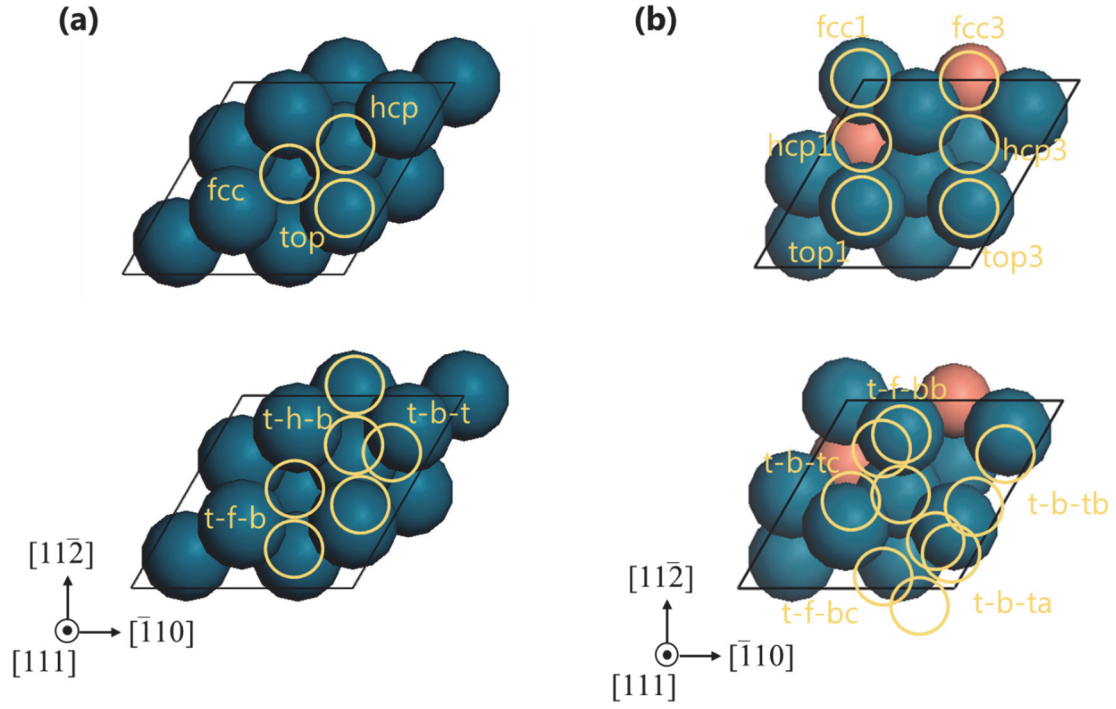


FIG. S2. Schematic illustration of models used for first-principles calculations, (a) Pd model and (b) Pd-Cu model. The blue and orange balls represent Pd and Cu atoms, respectively. The binding sites of O and O₂ species are shown by circles.