Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Supporting information

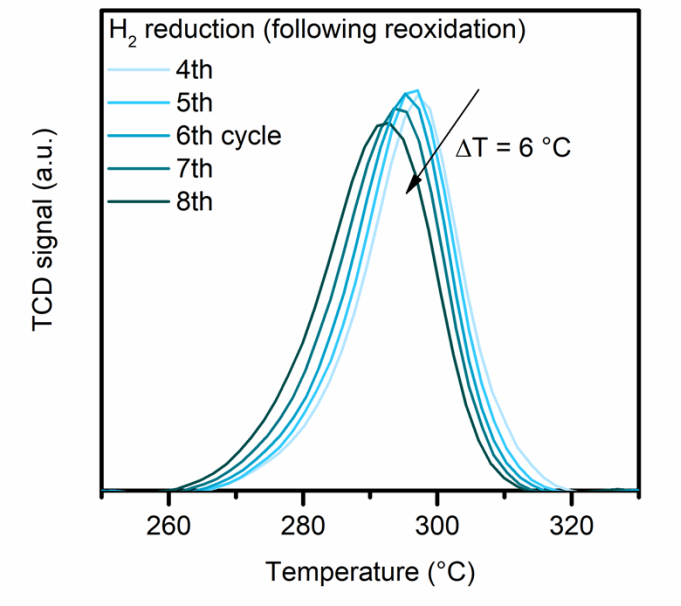
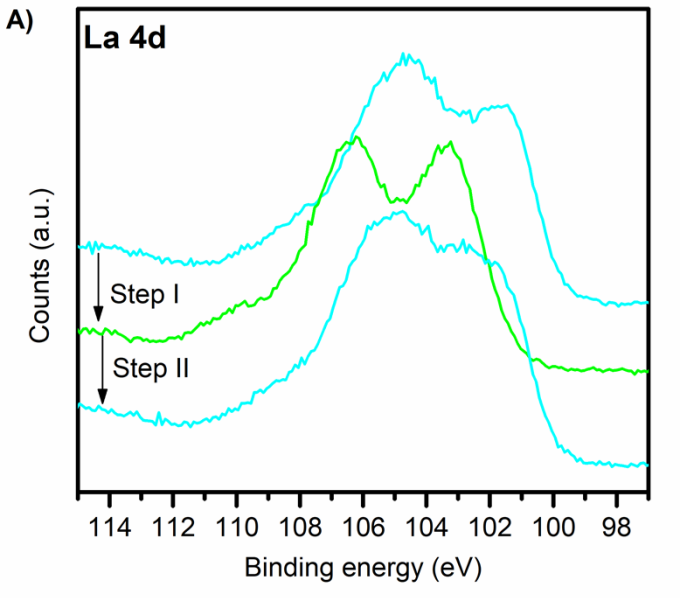


Figure S1. Cyclic H_2-TPR of LCAO followed with reoxidation after each reduction step.



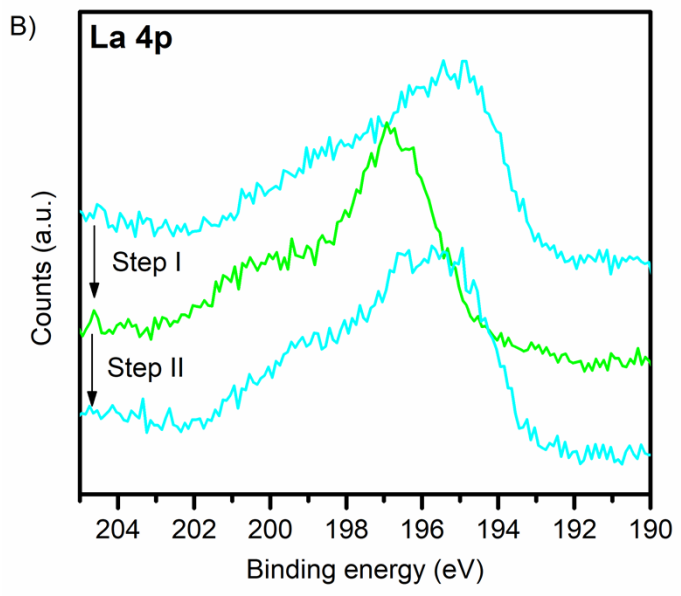
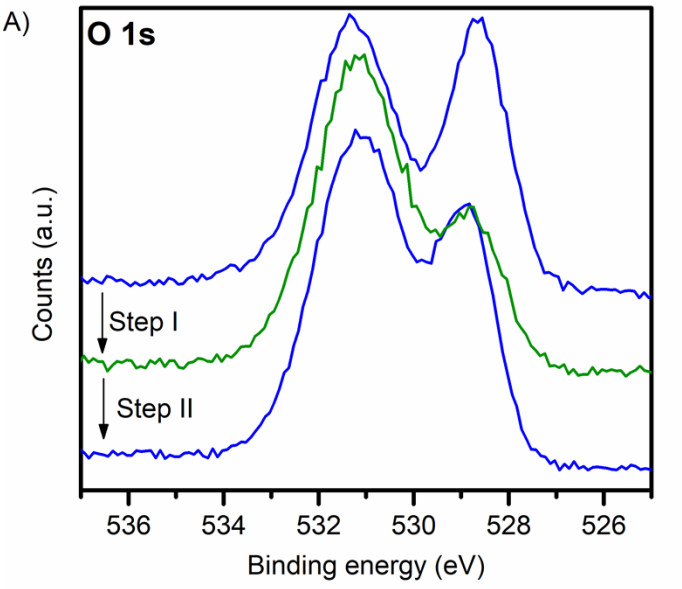
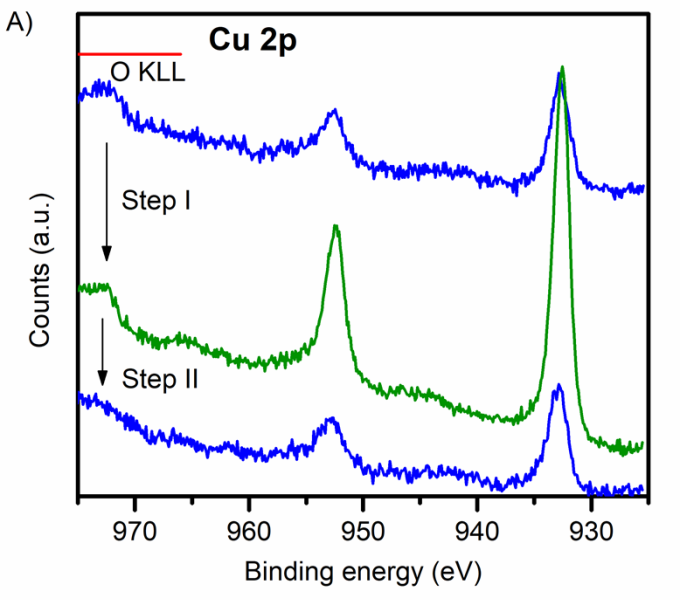
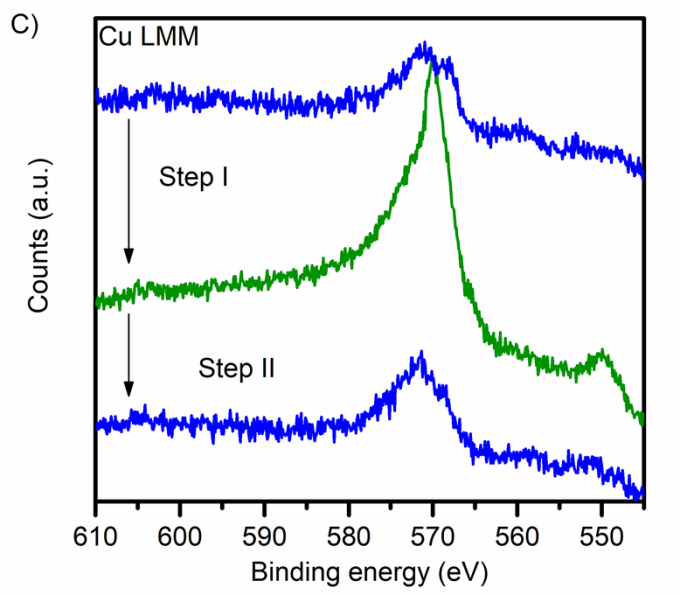


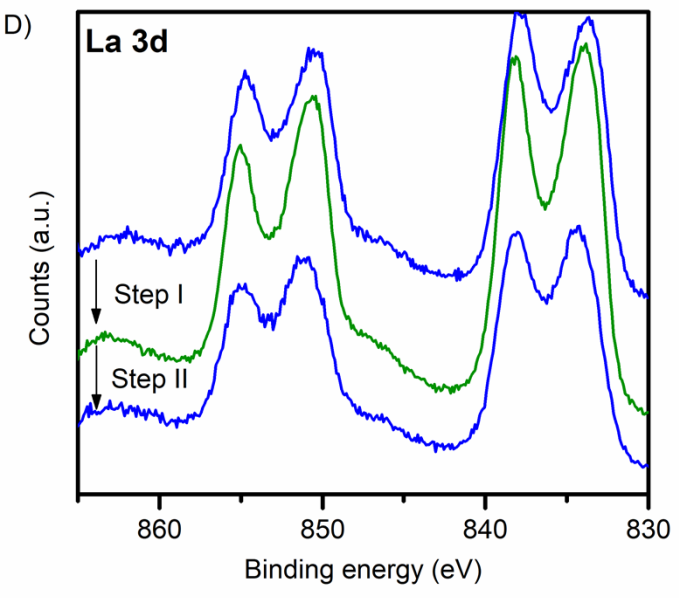
Figure S2. Supplementary XP spectra of LCO La 4d (A) and La 4p (B).



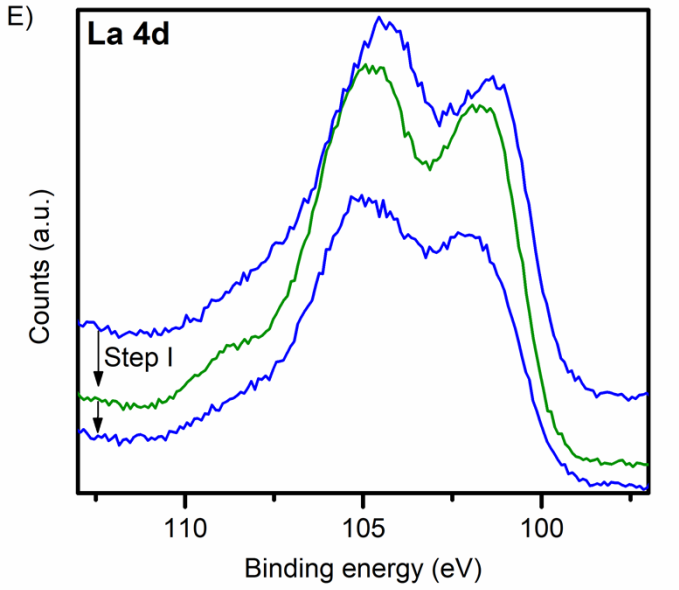

A)
Cu 2p
O KLL
Step I
Step II
Counts (a.u.)
970
960
950
940
930
Binding energy (eV)


C)
Cu LMM
Step I
Step II
Counts (a.u.)
610
600
590
580
570
560
550
Binding energy (eV)

D)


La 3d
Counts (a.u.)
Step I
Step II
860
850
840
830
Binding energy (eV)

E)


La 4d
Counts (a.u.)
Step I
110
105
100
Binding energy (eV)

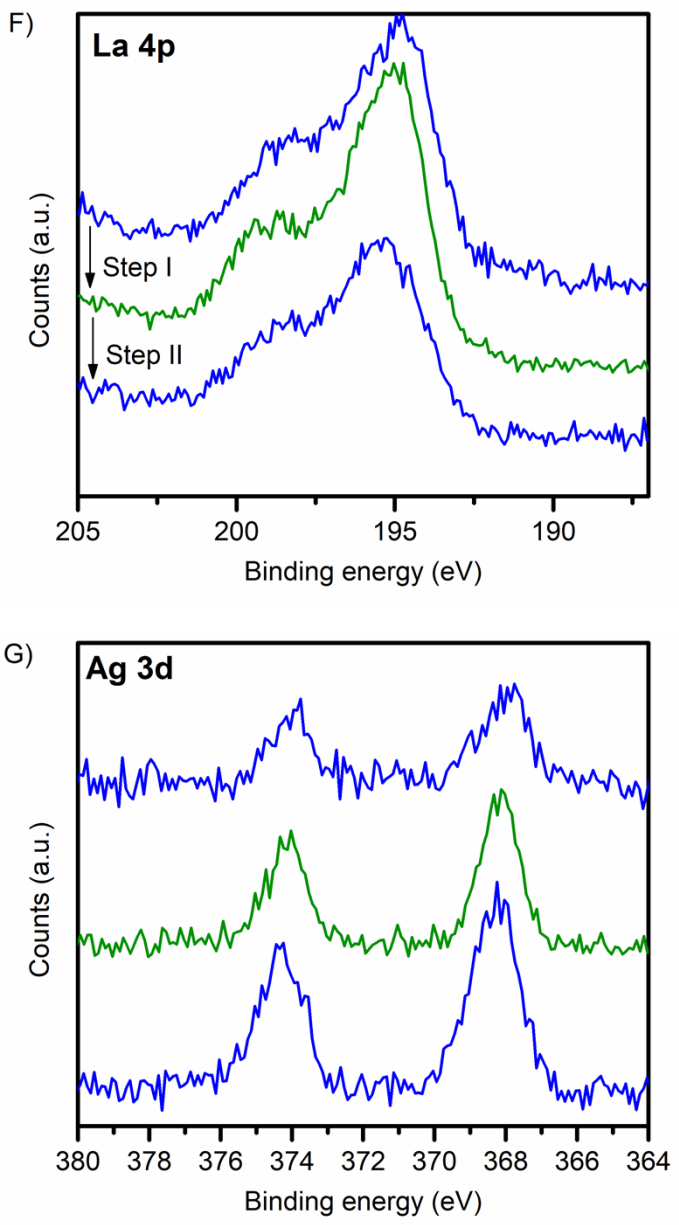
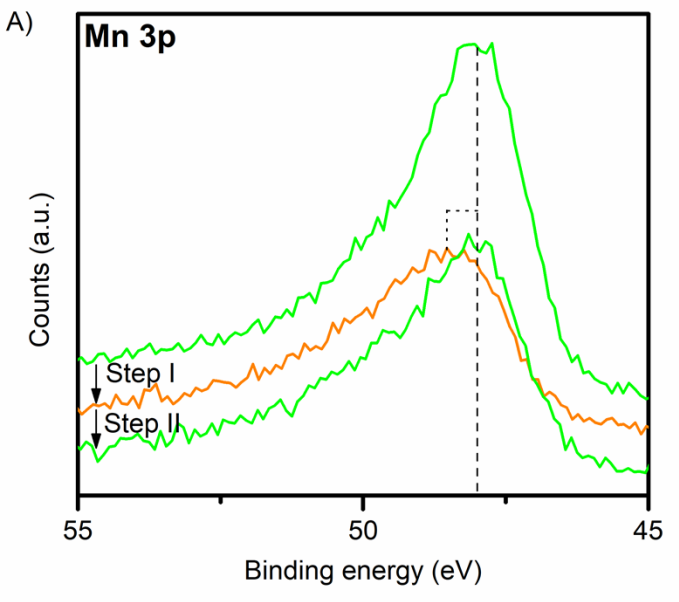
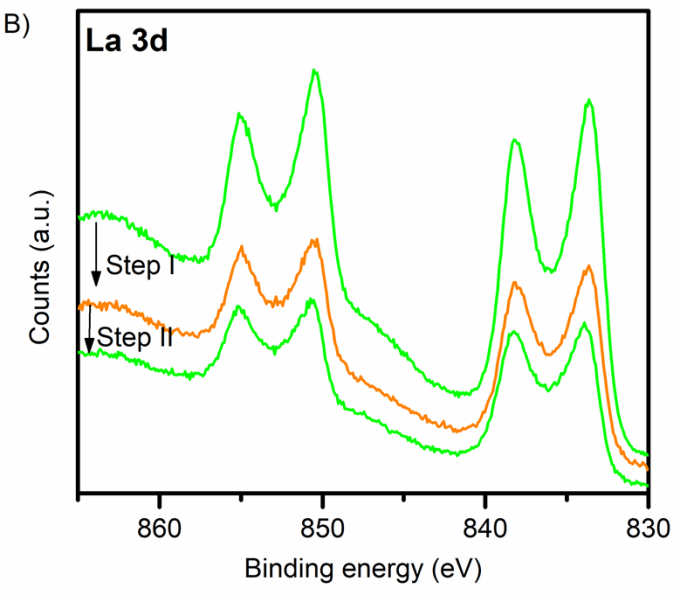
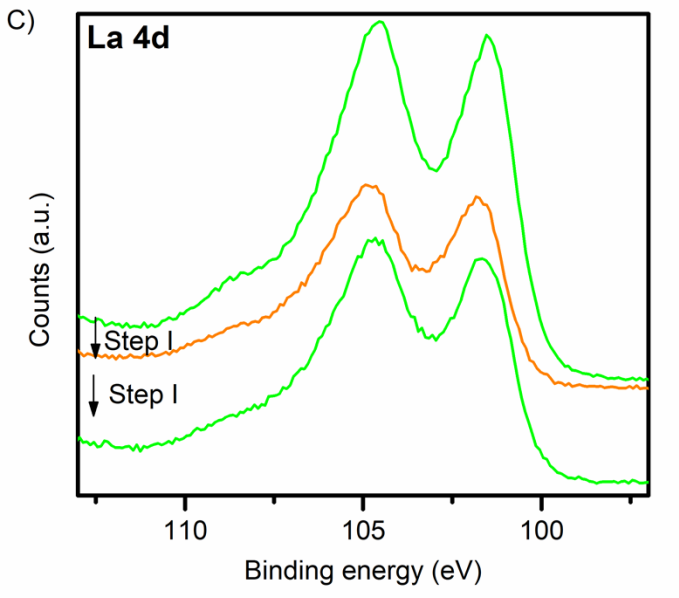


Figure S3. XP spectra of LCAO: O 1s (A), Cu 2p (B), Cu LMM (C), La 3d (D), La 4d (E), La 4p (F), Ag 3d (G). Note that Cu LMM overlaps with Ag $3p_{3/2}$.


A)
Mn 3p
Counts (a.u.)
Step I
Step II
55
50
45
Binding energy (eV)


B)
La 3d
Counts (a.u.)
Step I
Step II
860
850
840
830
Binding energy (eV)



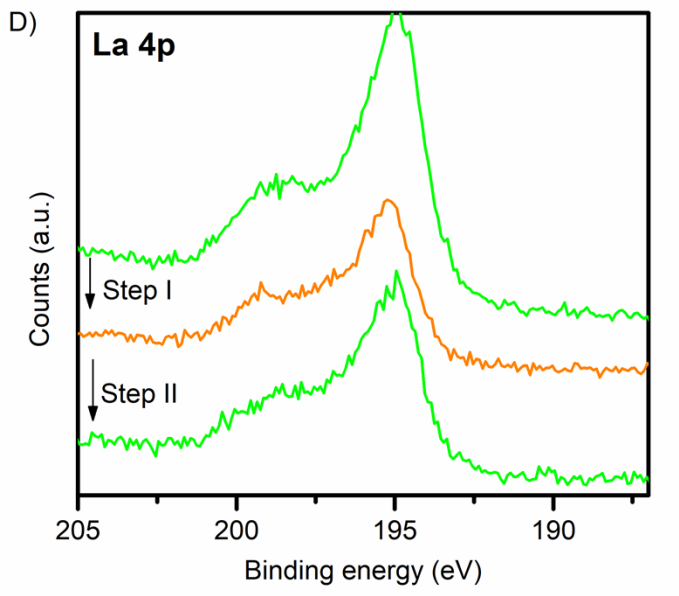
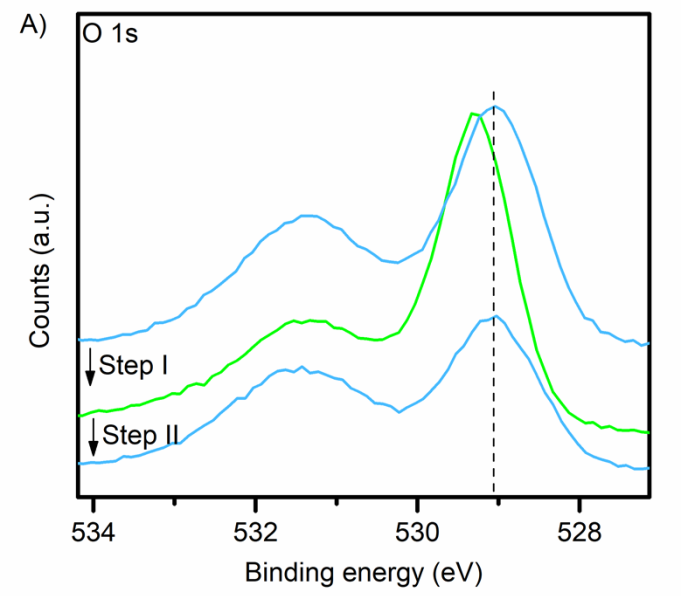
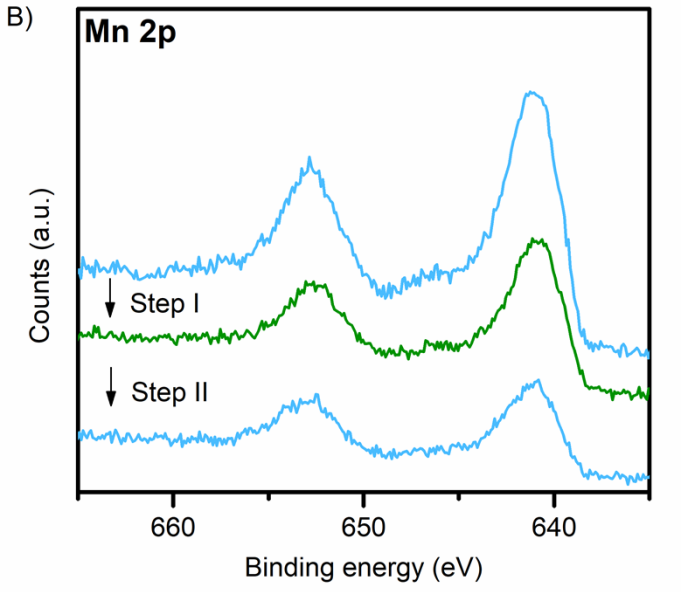
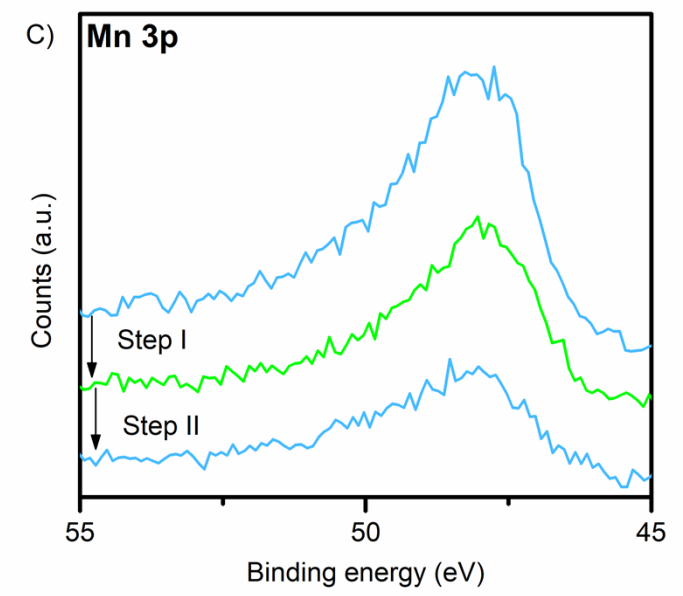
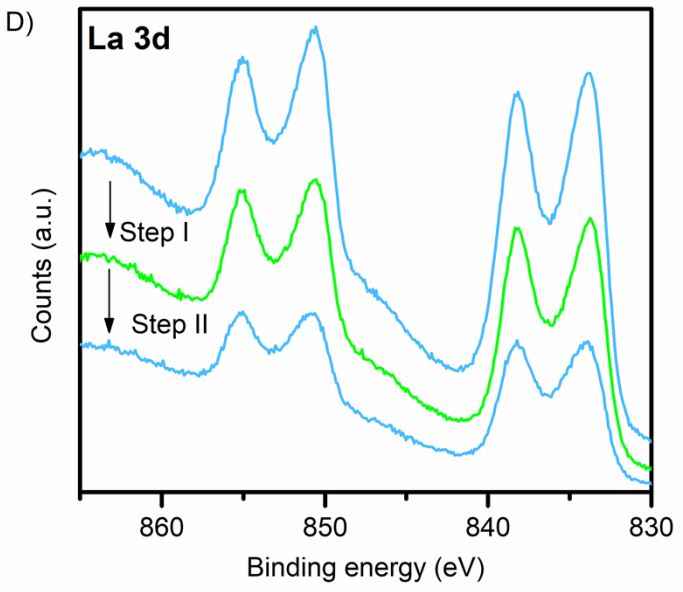


Figure S4. XP spectra of LMO: Mn 3p (A), La 3d (B), La 4d (C), La 4p (D)

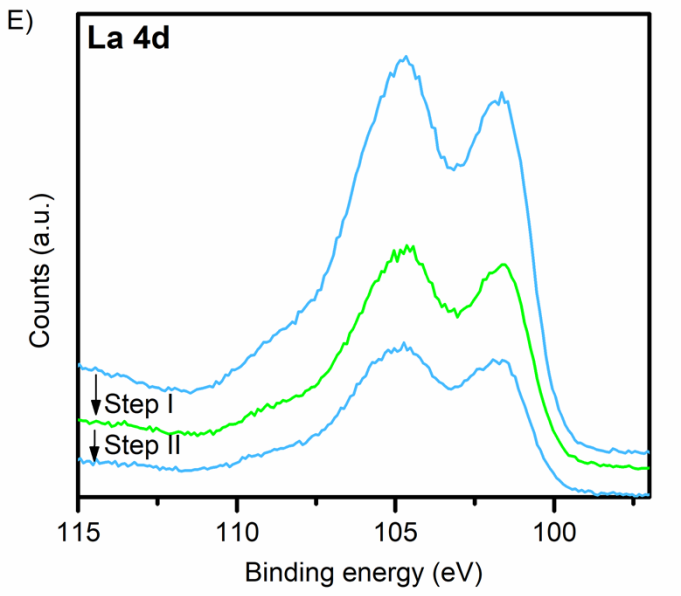

A)
O 1s
Counts (a.u.)
Step I
Step II
534
532
530
528
Binding energy (eV)


B)
Mn 2p
Counts (a.u.)
Step I
Step II
660
650
640
Binding energy (eV)

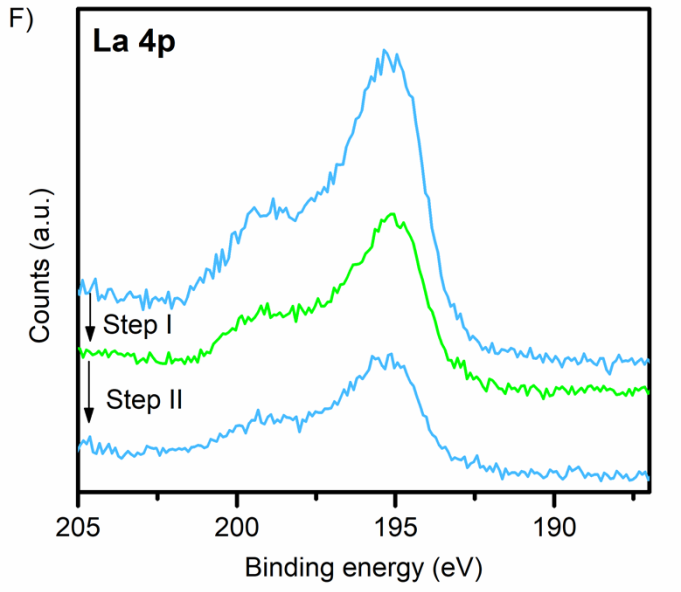

C)
Mn 3p
Counts (a.u.)
Step I
Step II
55
50
45
Binding energy (eV)


D)
La 3d
Counts (a.u.)
Step I
Step II
860
850
840
830
Binding energy (eV)

E)


La 4d
Counts (a.u.)
Step I
Step II
115
110
105
100
Binding energy (eV)

F)


La 4p
Counts (a.u.)
Step I
Step II
205
200
195
190
Binding energy (eV)

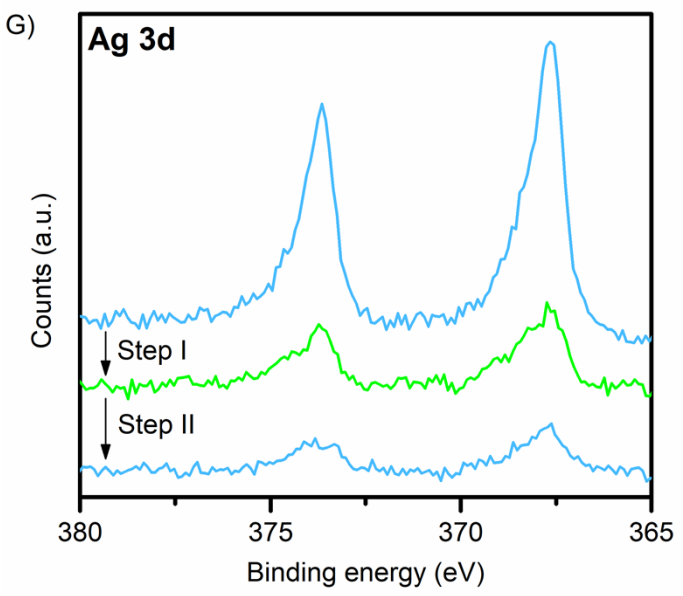
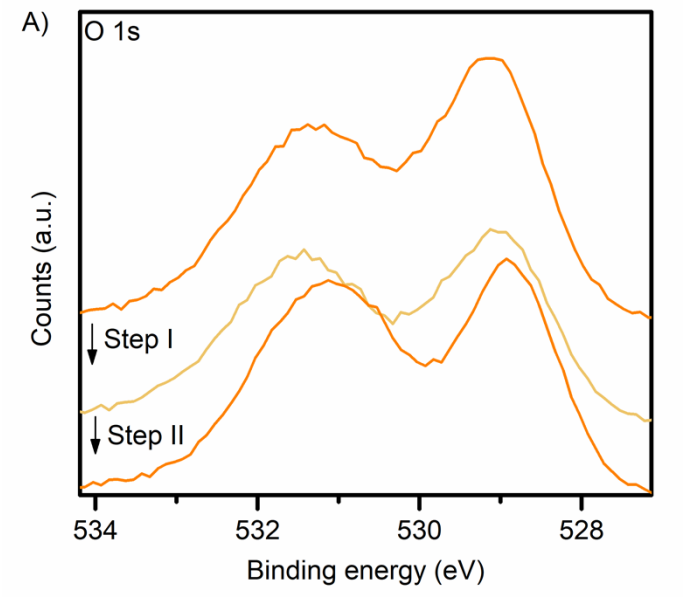
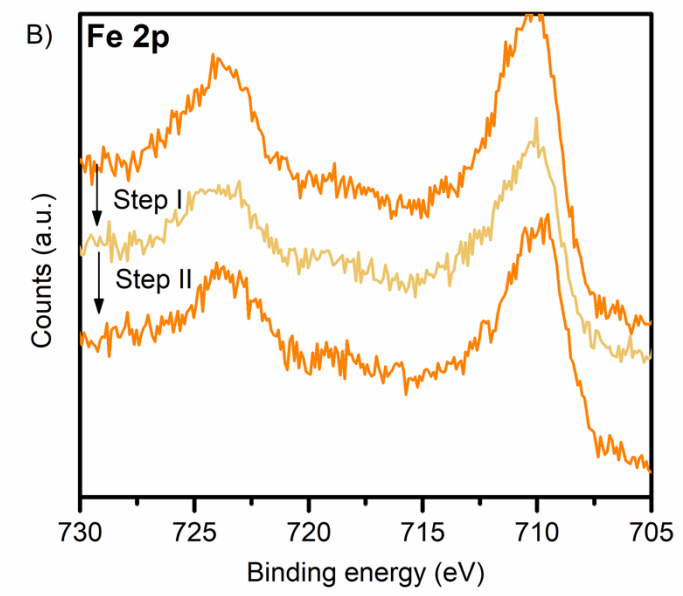
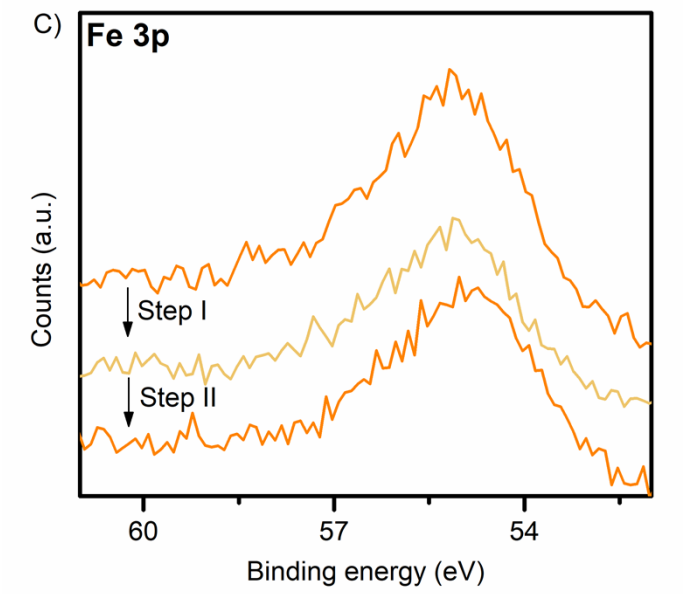


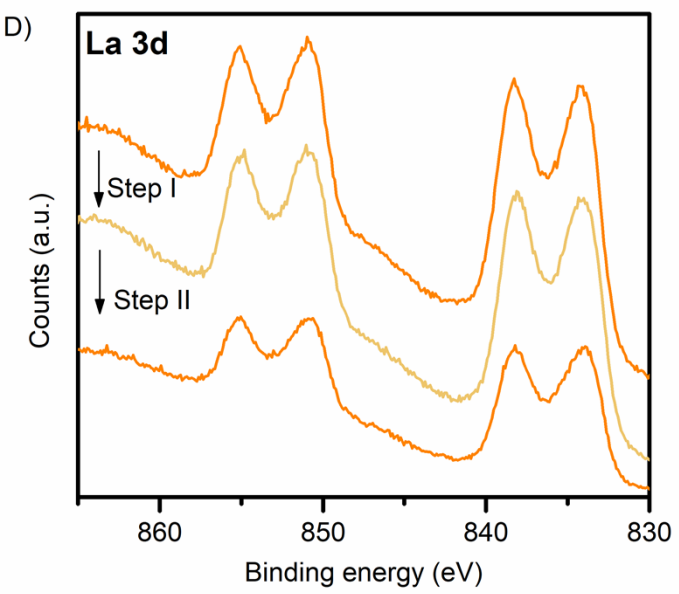
Figure S5. XP spectra of LMAO: O 1s (A), Mn 2p (B), Mn 3p (C), La 3d (D), La 4d (E), La 4p (F), Ag 3d (G).



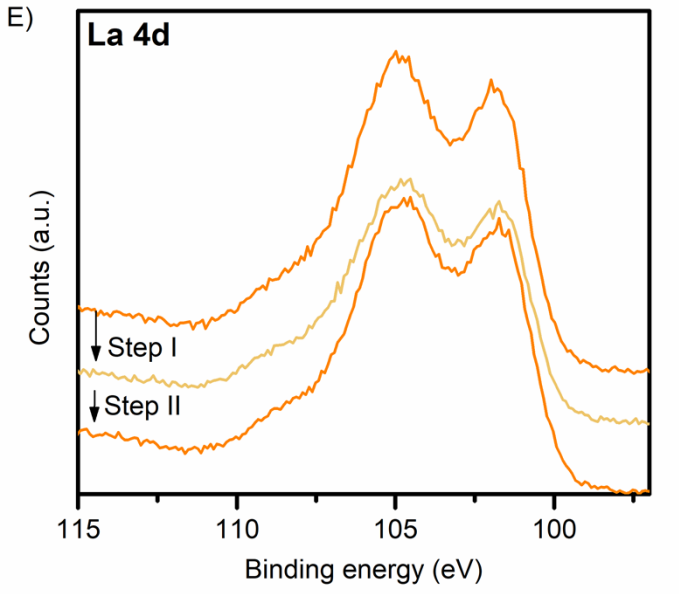

B)
Fe 2p
Step I
Step II
Counts (a.u.)
730
725
720
715
710
705
Binding energy (eV)


C)
Fe 3p
Step I
Step II
Counts (a.u.)
60
57
54
Binding energy (eV)

D)


La 3d
Step I
Step II
Counts (a.u.)
860
850
840
830
Binding energy (eV)

E)


La 4d
Step I
Step II
Counts (a.u.)
115
110
105
100
Binding energy (eV)

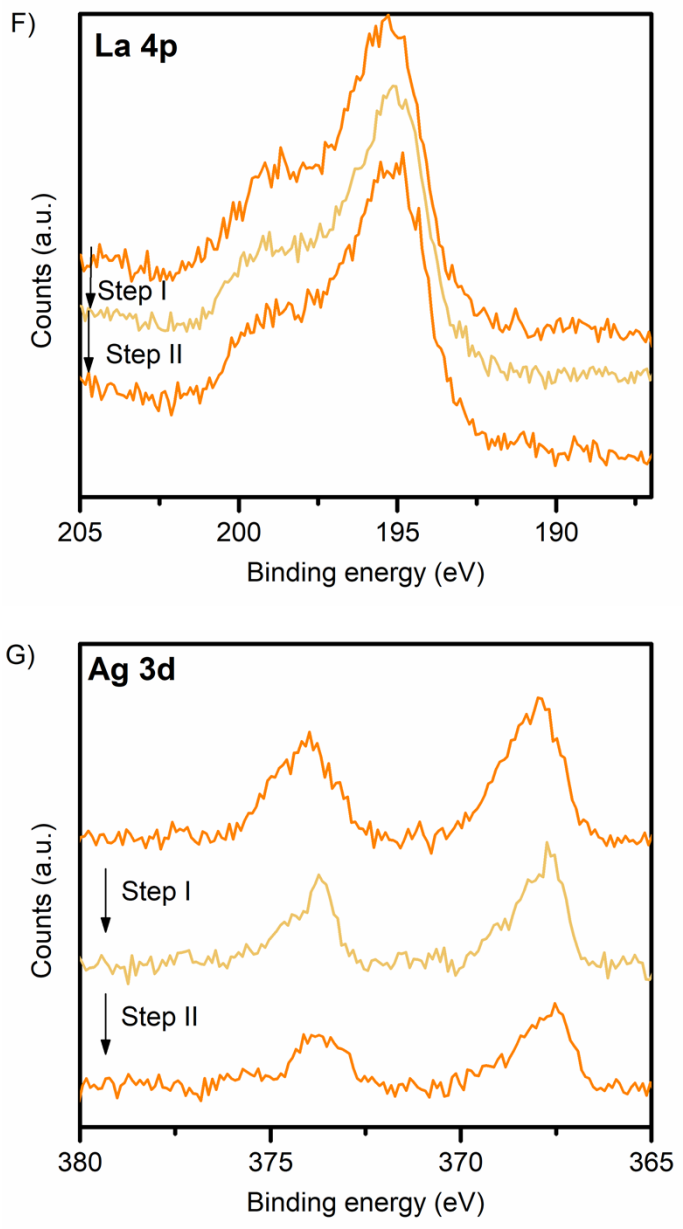


Figure S6. XP spectra of LFAO: O 1s (A), Fe 2p (B), Fe 3p (C), La 3d (D), La 4d (E), La 4p (F), Ag 3d (G).