

Supplementary information

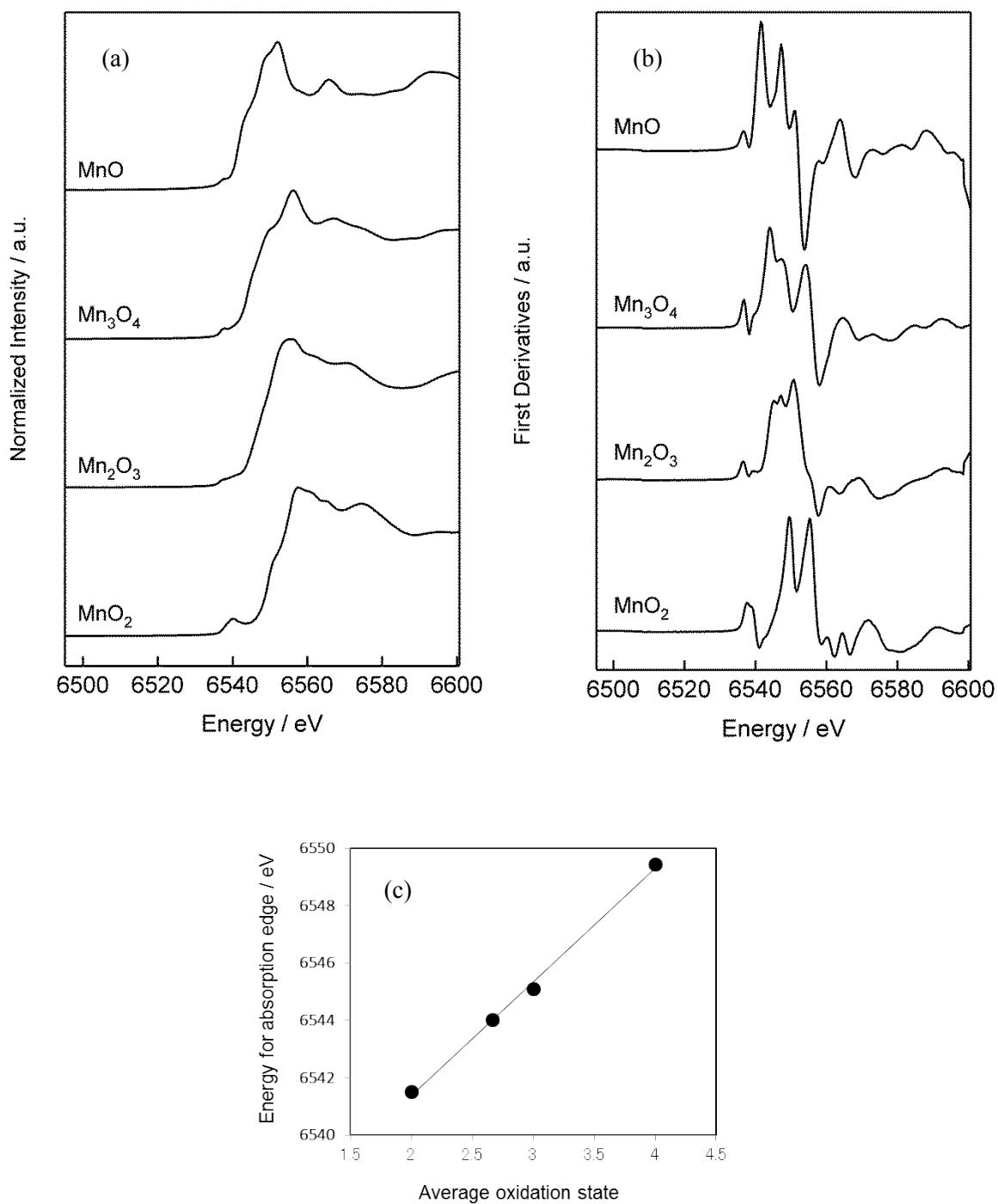


Figure S1. XANES spectra of manganese oxides. reference samples (a), the 1st derivatives for manganese oxides (b), and relationship between the absorption edge and manganese oxidation state (c).

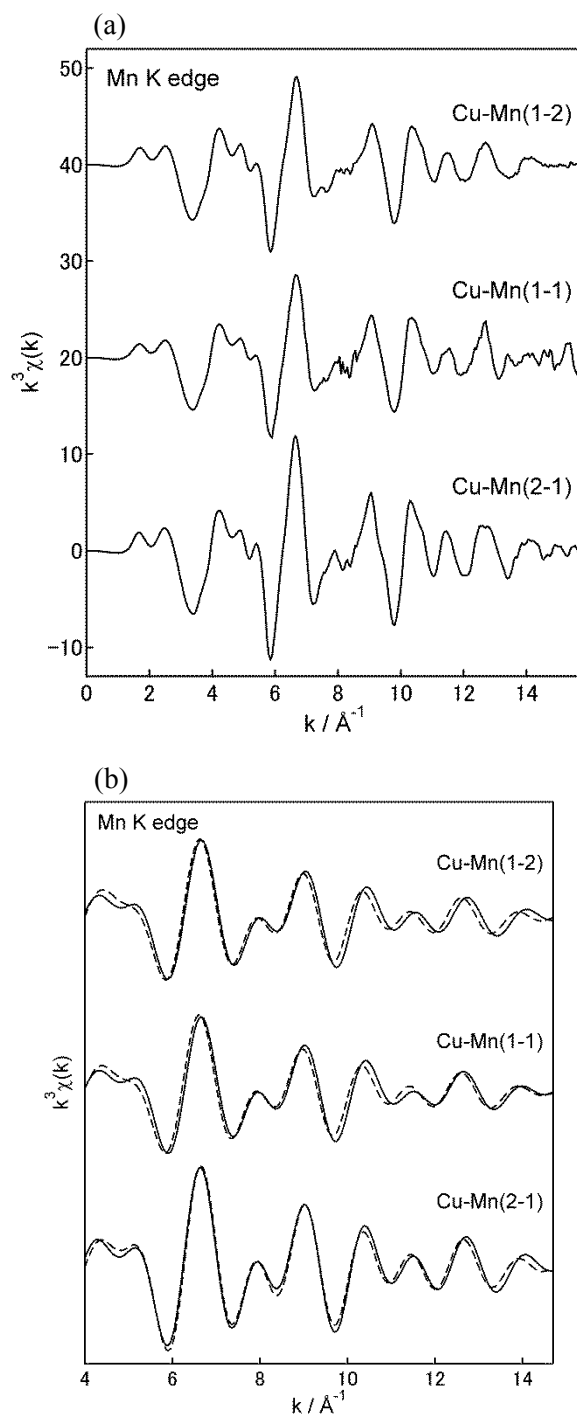


Figure S2. Mn-K edge EXAFS spectra of Cu-Mn mixed oxides. (a) Raw $\chi(k)$ data. (b) Comparison between the experimental data and fitting data.

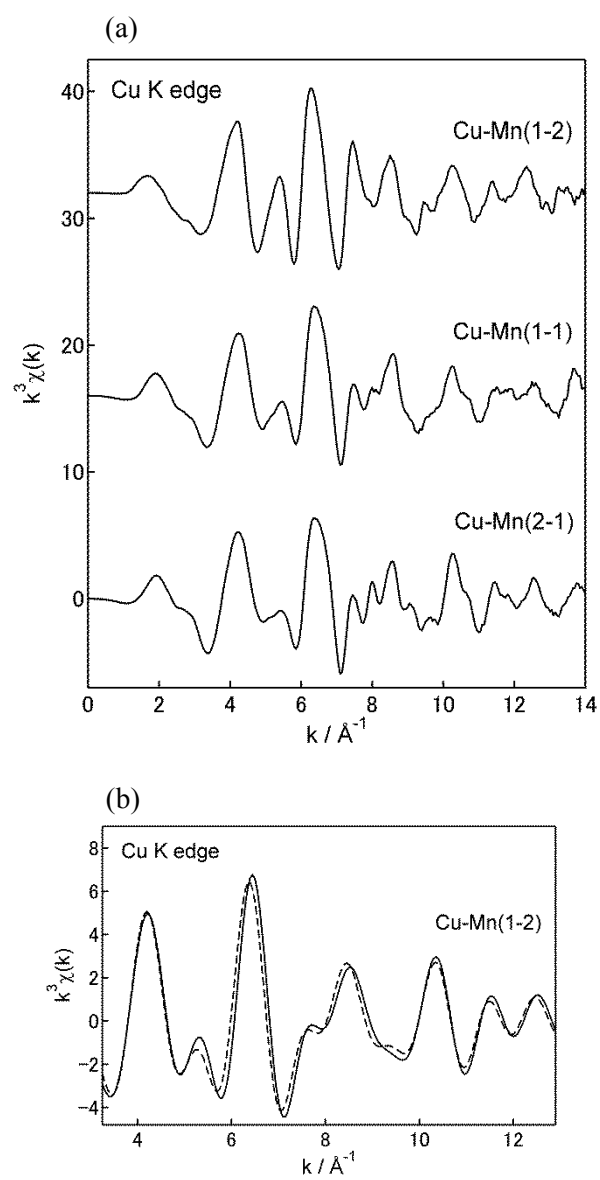


Figure S3. Cu-K edge EXAFS spectra of Cu-Mn mixed oxides. (a) Raw $\chi(k)$ data. (b) Comparison between the experimental data and fitting data.