Enantiospecific Chemistry of Aspartic acid on Copper Surfaces

Soham Dutta[1] and Andrew J. Gellman[*,1,2]
[1]Department of Chemical Engineering,
[2]W.E. Scott Institute for Energy Innovation,
Carnegie Mellon University, Pittsburgh, PA 15213, USA
*** Corresponding Author:** gellman@cmu.edu

Supplementary information

1. In figure 1, temperature programmed reaction spectra (TPRS) of aspartic acid (Asp) enantiomers, namely D-Asp and isotopically labelled L-Asp on Cu(643)$^{R\&S}$ are shown.[1] There is a statistically significant difference in the peak temperatures as indicated by the 95% confidence interval values, revealing enantiospecific decomposition kinetics. Each spectra is an average of six spectra and the bands represent one standard deviation at each temperature.

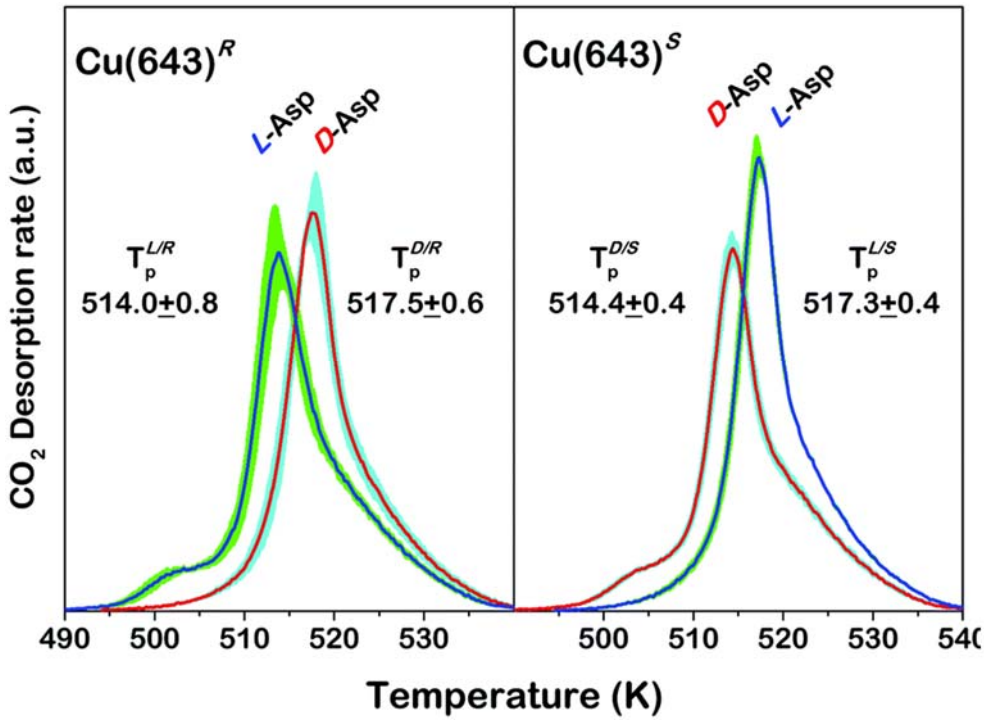

Figure 1

2. The enantiomeric excess of the gas phase (ee_g) in equilibrium with enantiomeric excess on the surface (ee_s), determined from equilibrium adsorption experiments is plotted in figure 2 for Asp on Cu(111) (green diamonds), Cu(653)$^{R\&S}$ (black circles) and Cu(3,1,17)$^{R\&S}$ (solid red triangles). On Cu(3,1,17)$^{R\&S}$, there is no aggregation of Asp enantiomers since the surface enantiospecifically adsorbs either L- or D-Asp depending on whether it is Cu(3,1,17)^{R} or Cu(3,1,17)^{S}. For Cu(111) and Cu(653)$^{R\&S}$, while ee_s (0) = 0, $ee_s \neq ee_g$ otherwise thus indicating enantiomer aggregation. This isotherm has been modelled using a cluster-adsorption model to determine

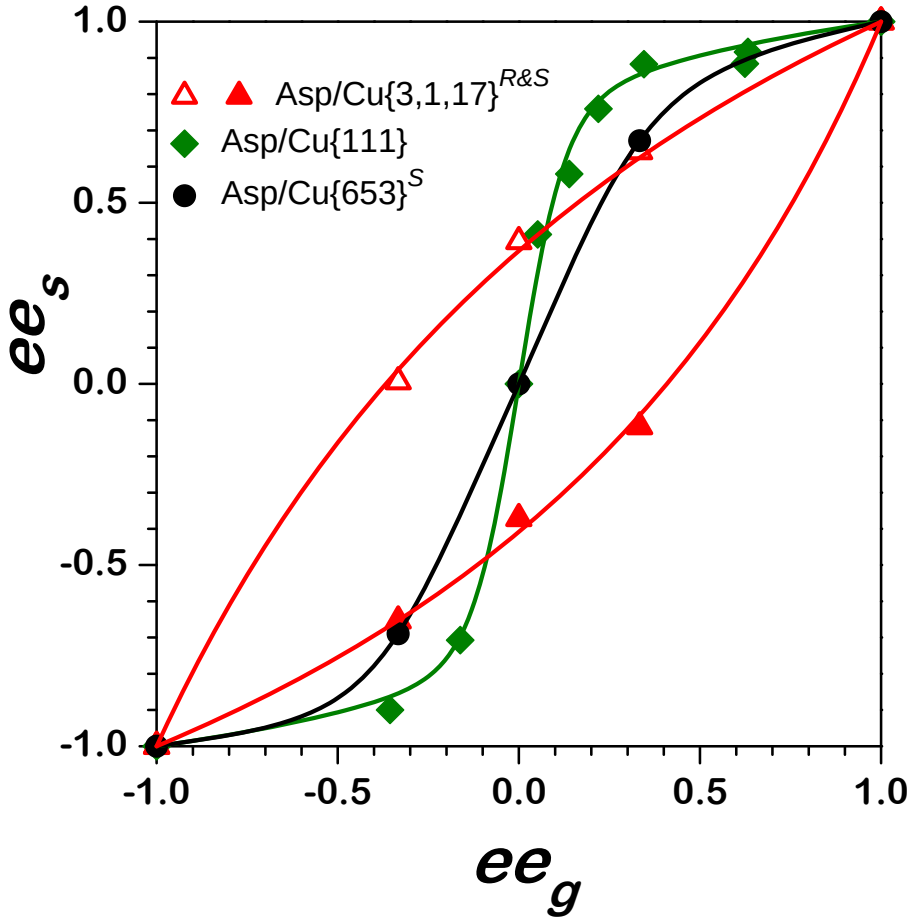

Figure 2

References

1. *Chemical Communication*, 2016, **52**, 14125
2. *J. Phys. Chem. C*, 2016, **120**,27285