

Supplementary data

Investigation of the active species in the carbon-supported gold catalyst for acetylene hydrochlorination

Xi Liu,¹ Marco Conte,¹ David Elias,¹ Li Lu,² David J. Morgan,¹ Simon J. Freakley,¹ Peter Johnston,³ Christopher J. Kiely² and Graham J. Hutchings^{1*}

¹Cardiff Catalysis Institute, School of Chemistry, Cardiff University, Cardiff, CF10 3AT

²Department of Materials Science and Engineering, Lehigh University, 5 East Packer Avenue, Bethlehem, PA 18015, USA.

³Process Technologies, Johnson Matthey plc, Orchard Road, Royston, SG8 5HE

Table S1 XPS Quantitative Data for Figure 2

Catalyst	% Au(0)		% Au(I)		% Au(III)	
	BE / eV	Area %	BE / eV	Area %	BE / eV	Area %
Au/H ₂ O	83.8	100	n.d.	n.d.	n.d.	n.d.
Au/HCl	84.2	100	n.d.	n.d.	n.d.	n.d.
Au/HNO ₃	83.9	17.9	84.9	22.3	86.3	59.8
Au/A.R.	83.9	66.7	85.1	13.5	86.4	19.8

n.d. = not determined.

Table S2 XPS Quantitative Data for Figure 3

Au/A.R.	% Au(0)		% Au(I)		% Au(III)	
	BE / eV	Area %	BE / eV	Area %	BE / eV	Area %
0 min	84.0	52.4	85.0	8.6	86.5	39.0
10 min	84.3	72.9	85.3	16.3	86.6	10.8
60 min	84.3	78.4	85.2	15.6	86.6	6.0
300 min	84.2	77.7	85.3	17.5	86.5	4.8

n.d. = not determined.

Table S3 XPS Quantitative Data for Figure 8

Catalyst	% Au(0)		% Au(I)		% Au(III)	
	BE / eV	Area %	BE / eV	Area %	BE / eV	Area %
1	84.0	65.1	85.0	18.7	86.4	16.2
2	83.9	83.2	n.d.	n.d.	86.0	16.8
3	83.9	61.6	84.9	24.8	86.2	13.6

n.d. = not determined.