Electronic supplementary information

Atomically precise silver clusters for efficient chlorocarbon degradation

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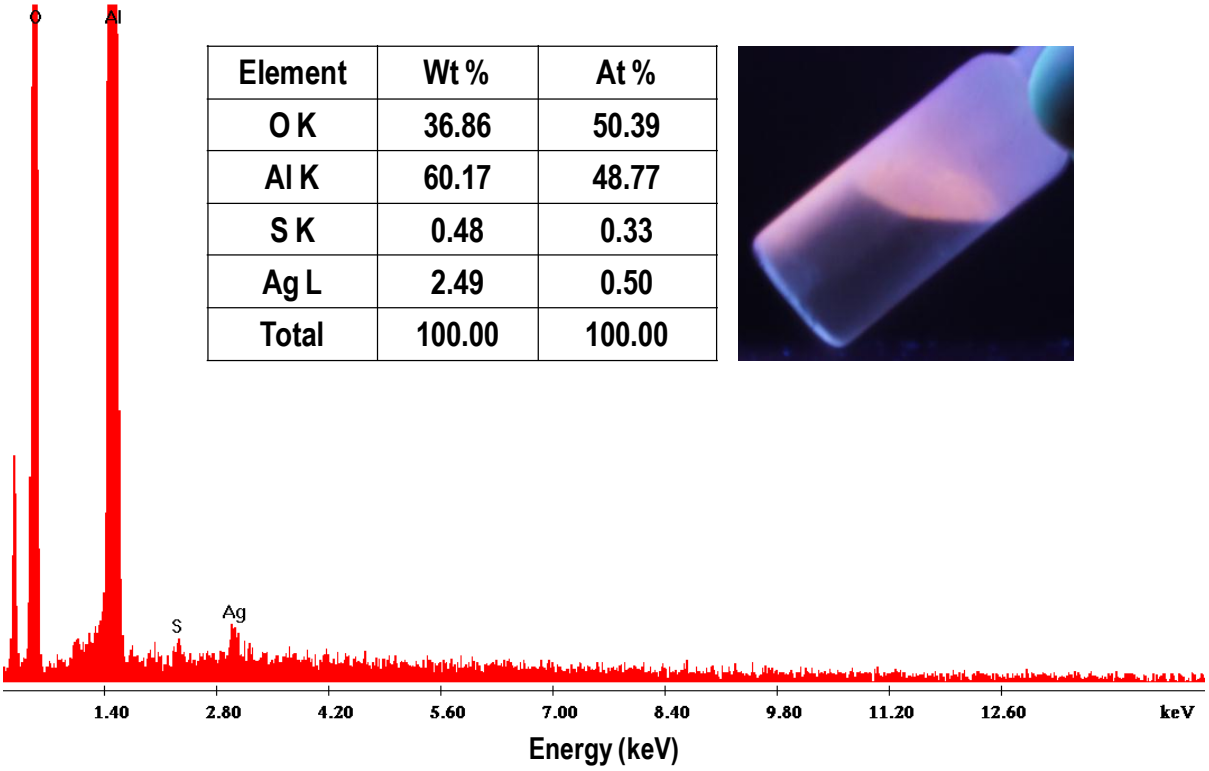


Element	Wt %	At %
O K	36.86	50.39
Al K	60.17	48.77
S K	0.48	0.33
Ag L	2.49	0.50
Total	100.00	100.00

Fig. S1 EDAX spectrum of supported Ag_9MSA_7 clusters which confirms the presence of Ag and S from the cluster on alumina. Insets are the quantification table of elements and a photograph of supported Ag_9MSA_7 clusters under UV lamp. Photograph was taken after dipping the sample bottle in liquid nitrogen. The blue scattered light around the glass bottle is due to scattering from condensed moisture. The emission of the cluster is red.

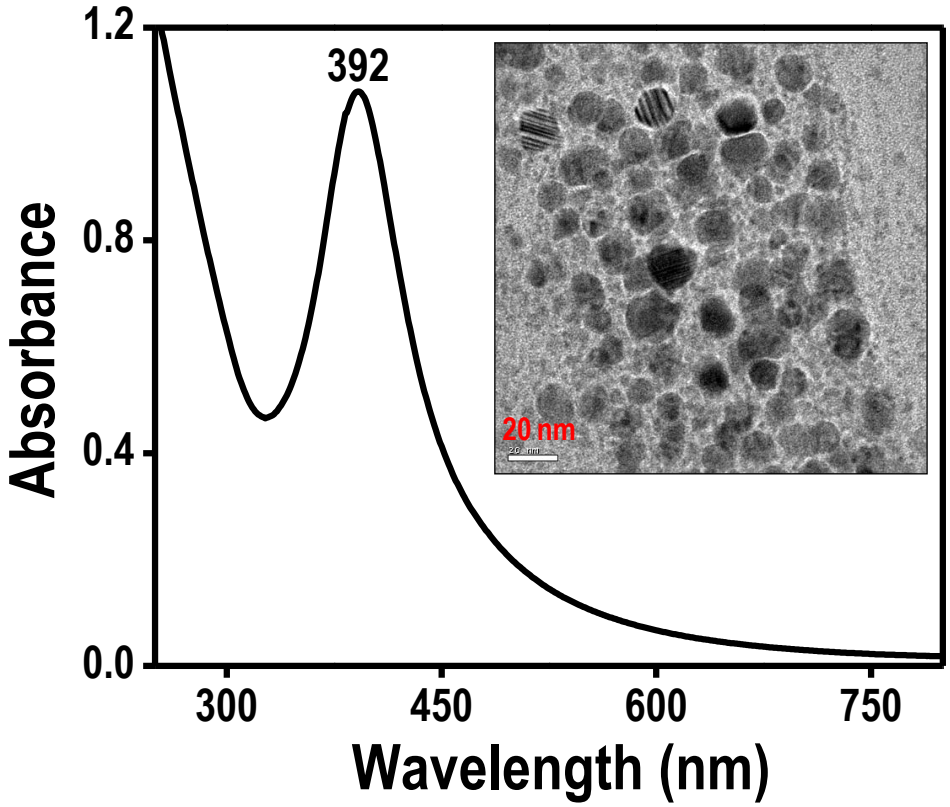


Fig. S2 UV/Vis absorption spectrum of as-synthesized Ag@MSA nanoparticles. Inset is a TEM image of Ag@MSA nanoparticles.

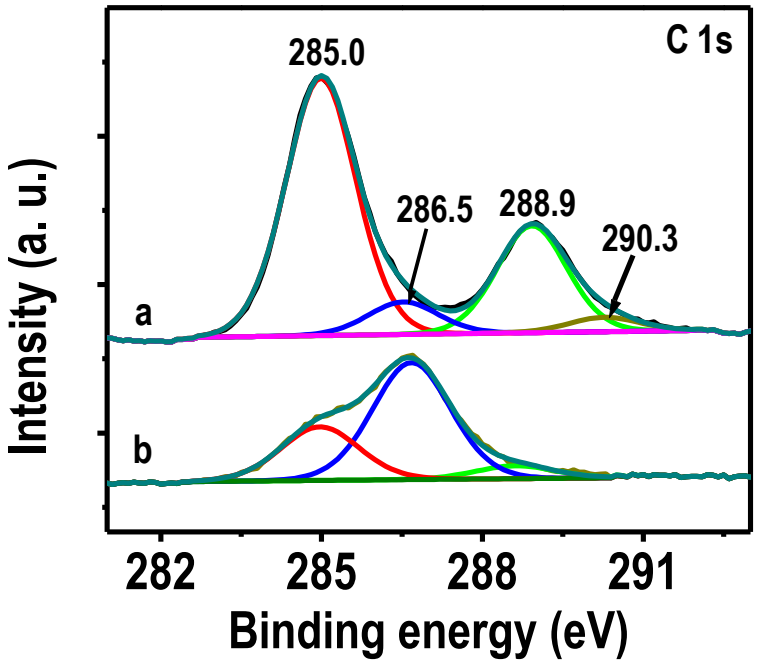


Fig. S3 C 1s region of the XPS of parent Ag_9MSA_7 clusters (a) and the product (b) obtained after the reaction of clusters with CCl_4.

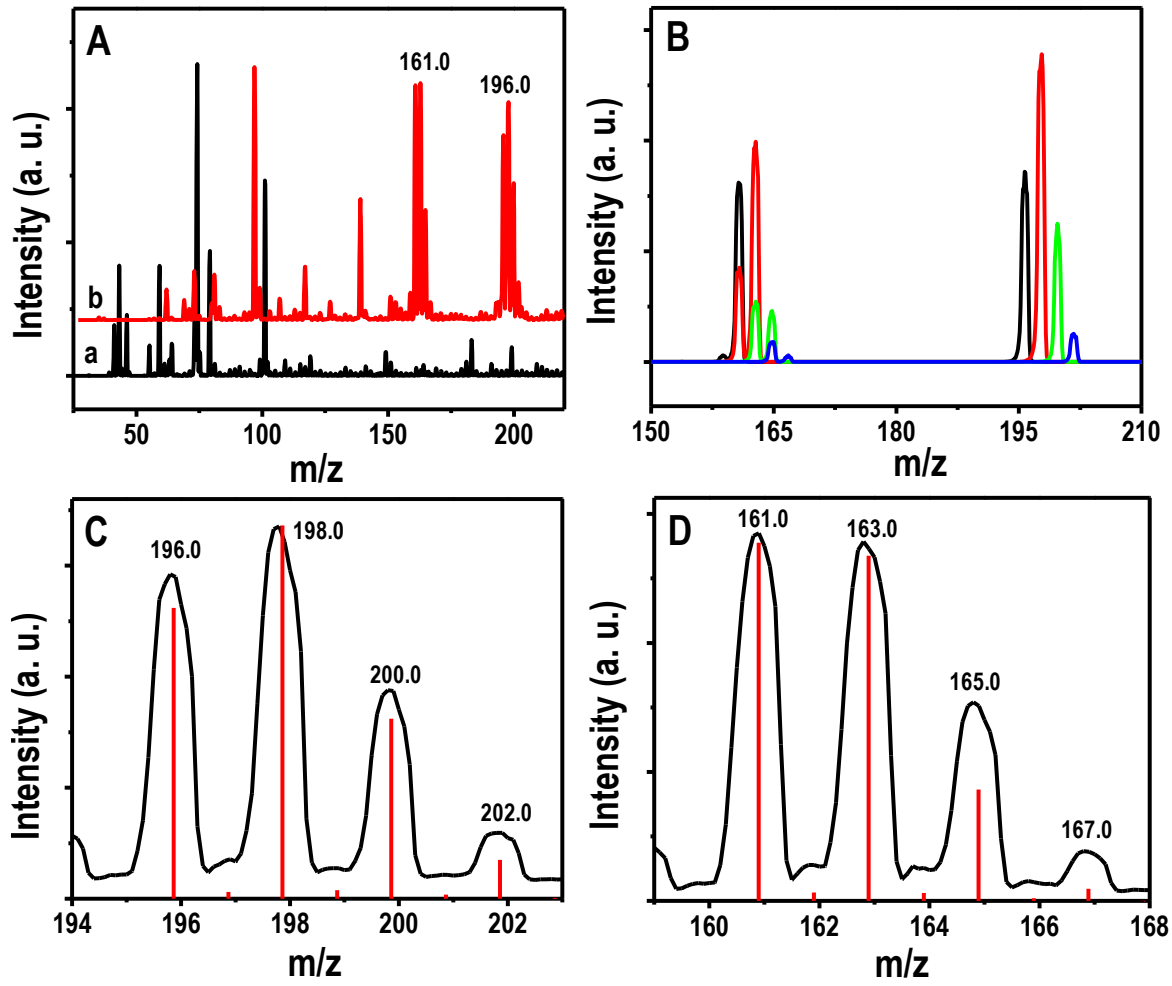


Fig. S4 A) ESI MS of reaction mixture of Ag_9MSA_7 and CCl_4 in positive and negative modes (traces a and b, respectively). B is MS/MS of m/z 196.0, 198.0, 200.0 and 202.0 in negative mode. C and D are comparisons of experimental (black traces) and calculated spectra (red traces) for species CCl_4COO^- and CCl_3COO^-, respectively.

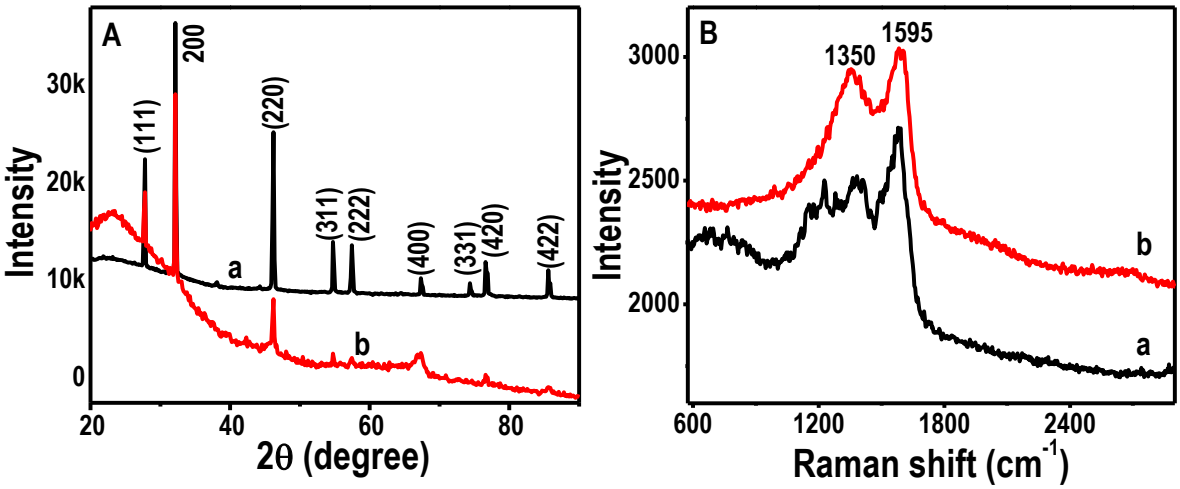
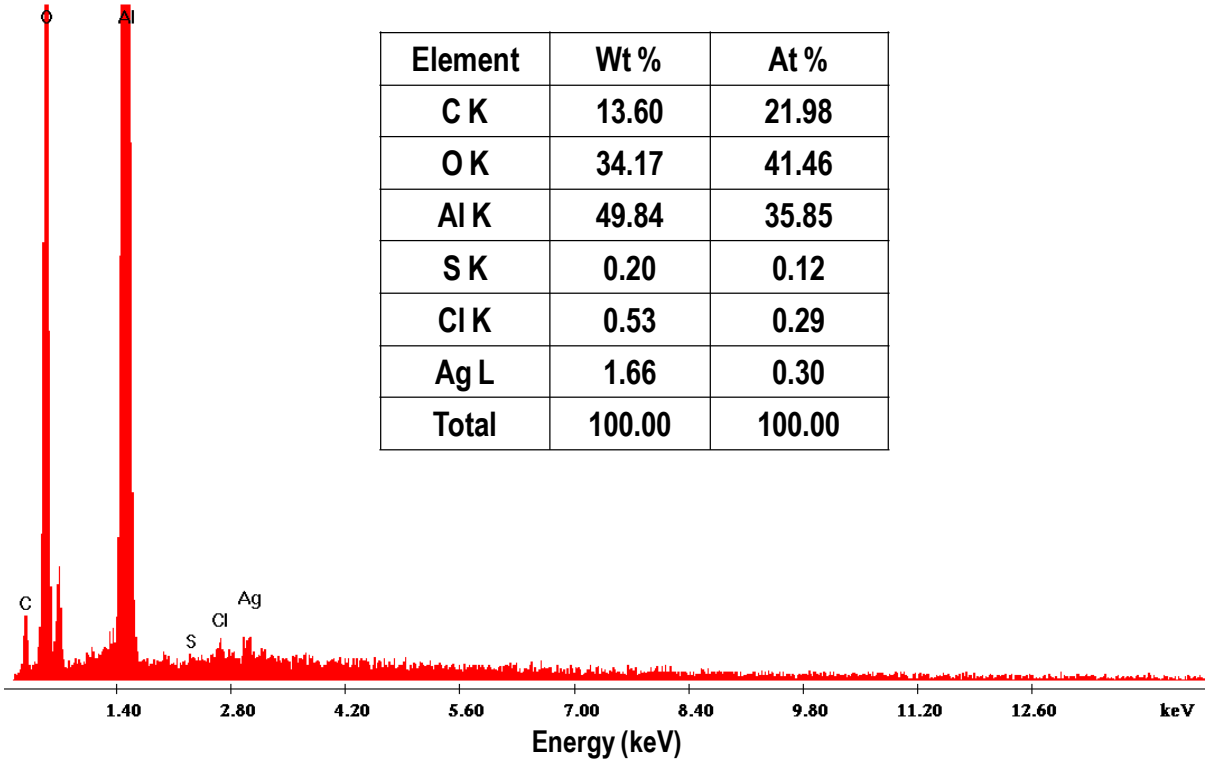


Fig. S5 A) Comparison of XRD patterns of as-prepared AgCl (a) and reaction product (b) of CCl_4 and supported clusters. B) Raman spectra of the reaction product of CCl_4 and supported clusters before (a) and after (b) washing with ammonia solution.



Element	Wt %	At %
C K	13.60	21.98
O K	34.17	41.46
Al K	49.84	35.85
S K	0.20	0.12
Cl K	0.53	0.29
Ag L	1.66	0.30
Total	100.00	100.00

Fig. S6 EDAX spectrum of the reaction product of CCl_4 and supported clusters showing the presence of Cl, Ag and S. Inset is a quantification table of elements which shows that the atomic ratio of Ag to S is 1:1.