Supporting Information

Catalytic Behavior of Au Confined in Ionic Liquid Film: A Kinetics Study for the Hydrochlorination of Acetylene

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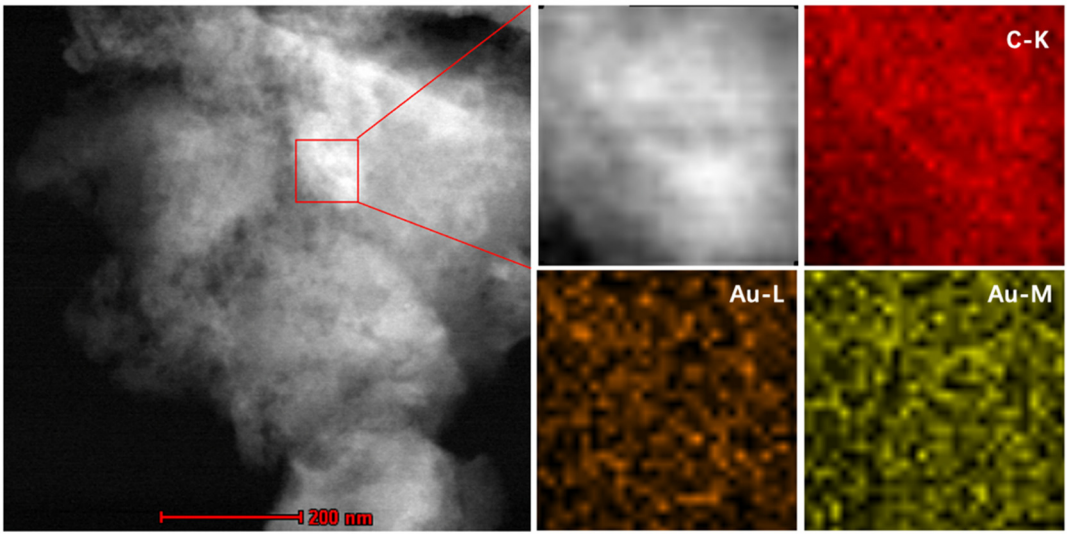


Figure. S1. High-angle annular dark-field images together with the elemental mapping of Au-IL/AC catalyst.

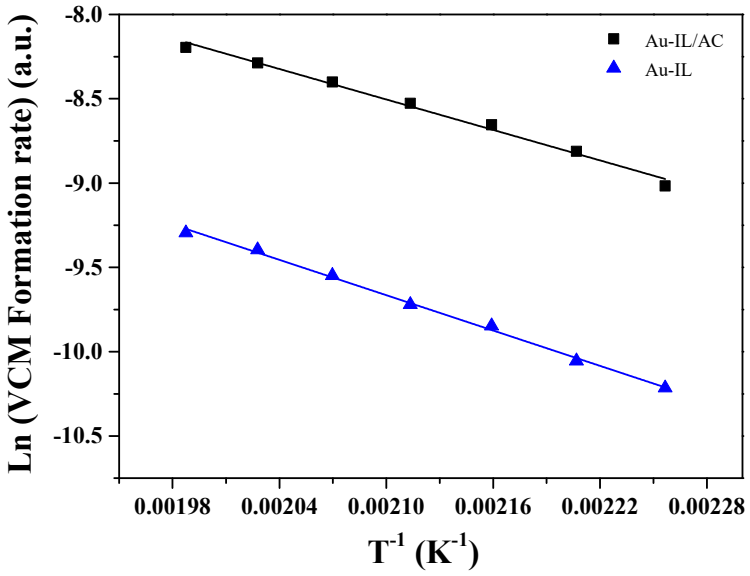


Figure. S2. Arrhenius plot for the VCM formation rate over the Au–IL/AC (black) and Au-IL (blue) catalysts. The gas-liquid catalytic performance was determined in a self-designed bubbling reactor. After 10 ml of the mixtures of Prmim-C and $HAuCl_4$, the reactor was heated up to the reaction temperature at a ramp rate of 10 K/min and held for 30 min under nitrogen atmosphere. Then, the C_2H_2/HCl mixed gas was fed into the reactor and reacted under the catalysis of the Au-IL catalyst. The off-gas from the reactor was sent through a bubbler containing aqueous sodium hydroxide solution to neutralize the free hydrogen chloride, then analyzed by using gas chromatography. Direct weighing method was adopted to approximately achieve the solubility of C_2H_2 and HCl in Prmim-Cl. A certain amount of ionic liquid was added to the glass reactor and the initial mass was recorded as M_1, then substrate molecule (C_2H_2 or HCl) was passed thorough the reactor which would absorb by ionic liquid, at 463 K and 1 bar. When the mass did not change in one minute, the vapor--liquid equilibrium was considered to be achieved and the final mass was recorded as M_2. The difference

between M_2 and M_1 was the solubility of the substrate molecule (C_2H_2 or HCl) in ionic liquid. The solubility evaluation of C_2H_2 and HCl in Prmim-Cl, with the test temperatures and pressures, were 5.58 mol/L and 0.14 mol/L, and the ratio of the solubility of HCl to C_2H_2 was nearly 40.