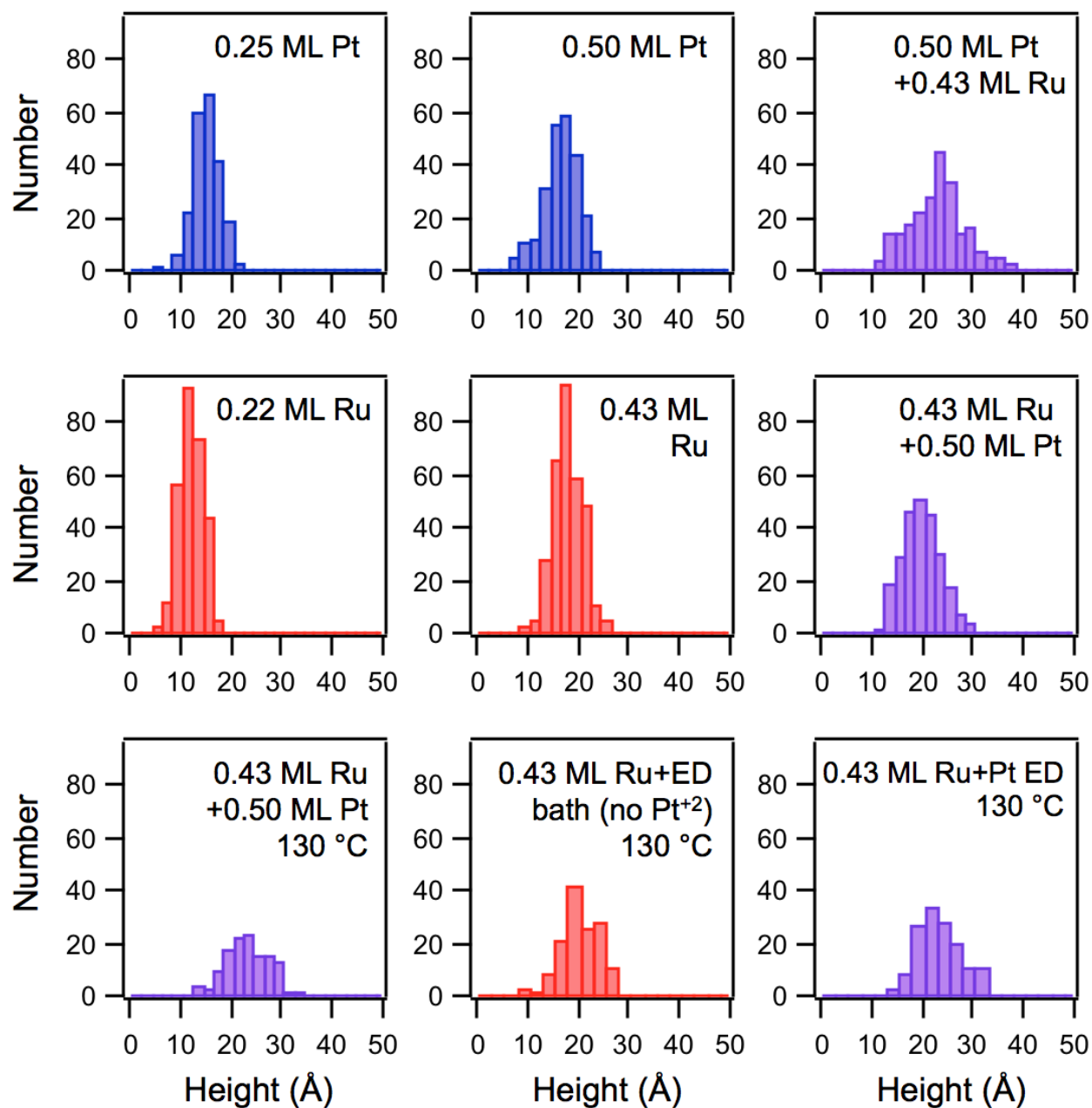


Supplemental text 1:

The use of Pt/C and Pt clusters/HOPG as sacrificial surfaces for the deposition of trace Ag contaminants before exposure to a second Pt/HOPG surface was unsuccessful, given that only Ag was deposited on the second Pt/HOPG surface. The reduction of Ag⁺ contaminants from the Ru⁺³ solution was also attempted using a three-electrode system with potentiostat control, with a Pt wire as the working electrode and a Hg/HgSO₄ reference electrode. Given that the standard reduction potential for Ag⁺ to Ag is 0.7 V greater than that of [Ru(NH₃)₆]⁺³ to [Ru(NH₃)₆]⁺², the working electrode was held at a potential close to the value corresponding to the standard potential for reduction of [Ru(NH₃)₆]⁺³ to [Ru(NH₃)₆]⁺². However, the Ru ED bath prepared from this reduced solution still resulted in the deposition of Ag.

Supplemental text 2:

The calculation of the number of Ag atoms needed to cover the surface of the 0.50 ML Pt/m-HOPG clusters is explained as follows. The clusters are assumed to have a paraboloid shape, and the total surface area is calculated from the average height and diameter of the clusters as well as the total number of clusters on the surface. The average height is measured directly from the STM images. However, cluster diameters are known to be overestimated in the STM images, and therefore an average diameter of 45.9 Å is calculated from the total number of atoms deposited on the surface as measured by the quartz crystal microbalance, the cluster density, the average height (16.0 Å), the FCC packing density for Pt, and the known diameter of a Pt atom (2.77 Å). The total number of Pt atoms at surface of the clusters is 8.46 x 10¹⁴, and therefore 8.46 x 10¹⁴ Ag atoms are required to form a full monolayer of Ag on the surface.



Supplemental Figure 1. Histograms of cluster heights for various metals on modified HOPG (m-HOPG). Surfaces exposed to the ED baths were heated to 130 °C for 3 min.