## Electronic Supplementary Information

## Formation of Rh frame nanorods by using Au nanorods as sacrificial template

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Fig. S1. Au@Rh NRs and Rh nanoframes obtained at an ascorbic acid concentration of 2.3 mM.



## Fig. S2. Au@Rh NRs and Rh nanoframes obtained at a CTAB concentration of 3M.



Fig. S3. High-resolution TEM image of Rh nanoframe obtained after 12 h.



**Fig. S4**. Time evolution of plasmom resonance band of Au NRs in the presence of CTAB after the addition of HCI.







**Fig. S6**. Time evolution of plasmom resonance band of decahedral Au nanoparticles in the presence of CTAB after the addition of HCI.



**Fig. S7**. XRD patterns of decahedral Au@Rh particles. Red lines shows standard positions of Rh peaks.