

# Surface and Interface Chemistry of Metal Nanoclusters and Ultrathin Nanocrystals

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Surface of nanomaterials plays an important role in determining many of their physical and chemical properties.<sup>1</sup> The synthesis of high-quality metal nanoparticles often involves the use of organic capping agents. However, due to the lack of effective tools to characterize the surface structure of small ligands on metal nanoparticles, it is extremely challenging to deeply understand how surface ligands influence the core structure and also overall properties of metal nanoparticles. In this presentation, we will focus on the surface chemistry of two nice model metal nanoparticulate systems, atomically precise metal nanoclusters and ultrathin metal nanocrystals. The importance of small ligands in controlling the surface structure and morphology of metal nanocrystals and nanoclusters will be discussed.<sup>2-8</sup> Together with the unique metal nanostructures (e.g., ultrathin Pd nanosheets) made by the use of specific ligands, the structures of some giant metal nanoclusters will be presented. I will then talk about how the surface ligands influence the catalytic performance of metal nanocrystals. The presence of surface ligands on metal nanoparticles are often considered deleterious to their catalysis applications. However, in my talk, some examples including metal nanoclusters and ultrathin metal nanocrystals will be given to discuss how surface ligands promote the catalysis of metal nanoparticles.<sup>9-11</sup>

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