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Molecular tools for manipulating the size, size distribution and alloy formation in metal nanoparticle systems



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Abstract: The transformation of the inert noble metals into functional materials not only involves their size reduction to nanometer scale but also their surface functionalization with appropriate molecules. Such surface functionalization assumes significance not just for their stability in diverse solvent media but defines the way nanoparticles (NPs) interact either with themselves or with the environment/biological systems. In general, organic molecules/ligands which have at least one functional group are known to stabilize NPs against aggregation. Apart from this, ligands also play a key role in modulating many characteristics of NPs viz. controlling their size, morphology and their dispersional stability in a given solvent medium. This talk briefly reviews these aspects. In particular we will introduce “Digestive Ripening” (DR), a post-synthetic size modification process as a reliable and reproducible method offering great control over size and size distribution of NPs. DR is known for converting a polydisperse NP system, post synthesis to nearly monodisperse NPs with the help of surface active organic molecules/ligands.

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