Catalyst crystallite size is an important parameter affecting the behavior of many catalytic systems in use today. Crystallite sizes of interest can range from tens of Angstroms to tens of nanometers. Techniques employed in the determination of crystallite sizes in this size range include EXAFS, XRD, and TEM. Each of these techniques has strengths and weaknesses. Short range order around absorbing atoms can be precisely determined by EXAFS, and inference of crystallite size can be made from the measurement of the fraction of incompletely-coordinated surface atoms in nano-sized clusters. However the crystallite size that is inferred from this analysis is model dependent, and the technique loses sensitivity as the clusters approach sizes where bulk properties dominate. X-ray diffraction, useful over a somewhat broader crystallite size range, is also somewhat model dependent and suffers from sensitivity issues when the catalyst of interest is highly diluted by support material. Transmission electron microscopy provides unambiguous information regarding observed crystallite sizes and shapes, but typically only samples a small fraction of material. In this work we present the results of EXAFS, XRD and TEM analysis of palladium catalyst particles supported on alumina, comparing crystallite sizes obtained using the three techniques.