390b Sintering Studies on Model Catalytic Systems

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Sintering is one of the most important deactivation mechanisms of heterogeneous catalysts. A fundamental understanding of the mechanistics behind sintering might help in making catalysts more stable towards sintering. Direct electron microscopy observations of commercial catalysts are inherently difficult due to the tortuous structure of such materials. Model catalytic systems consisting of metal particles on flat single crystal substrates provide a means of making the active metal particles visible. Such samples can be made by spin-coating metal precursors on the flat substrates. State-of-the-art scanning electron microscopy (SEM) makes it possible to observe metal particles in the size regime relevant in heterogeneous catalysis. Samples are treated under different conditions mimicking the industrial environment. Observations before and after treatment will show the effects of various treatments. Studies like these can give a fundamental insight into the sintering of heterogeneous catalysts.