Observation of Platinum Nanoparticle Catalytic Reaction by in situ heating graphene liquid cell TEM

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Platinum nanoparticles are widely used as catalyst in liquid phase chemical reactions. Catalytic reaction often involves changes in morphologies of nanoparticle catalysis. However, directly observing those reactions in real-time and real-space is challenging. We developed imaging platform for in situ transmission electron microscopy (TEM) which allows direct observation of catalytic reactions at elevated temperature by incorporating graphene liquid cell with heating device. We observed methyl cyclohexane (MCH) dehydrogenation reaction catalyzed by platinum nanoparticles supported on anodic aluminium oxide (AAO), which undergo deformation during the dehydrogenation reaction.