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Sintering of multi-metallic nanoparticles VINEETHA MUKUNDAN, Purdue University, BIRGID WANJALA, RAMESHWORI LOUKRAKPAM, JIN LUO, JUN YIN, CHUAN-JIAN ZHONG, Binghamton University, OANA MALIS, Purdue University — During the thermal treatment employed to activate the Pt-based nano catalysts used in fuel cell applications, the particles undergo structural transformations that affects their chemical performance. The mechanisms of coalescence and grain growth in bimetallic/trimetallic nanoparticles supported on planar silica on silicon are investigated using in-situ synchrotron based X-ray diffraction in the temperature regime 400-900C. The sintering process was found to be accompanied by lattice contraction and L10 chemical ordering. The mass transport involved in sintering is attributed to grain boundary diffusion and its corresponding activation energy is estimated from data analysis.

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