

The largest planar palladium nanosheet

Summary

Although discrete nano-sized compounds of which shape is a monolayer sheet of multiple atoms have attracted attention of scientists, monolayer transition metal nanosheets are hardly accessible. A template synthesis of the “folding” palladium nanosheet consisting of eleven palladium atoms by treatment of a ladder polysilane, decaisopropylbicyclo[2.2.0]hexasilane (**1**), with Pd(CN^tBu)₂ (Figure 1) was developed by Professor Hideo Nagashima of the Institute for Materials Chemistry and Engineering at Kyushu University. The molecular structure of the Pd₁₁ nanosheets was unequivocally determined by X-ray diffraction analysis, in which eleven palladium atoms are arranged in one “folding” plane and six silicon atoms act as the linker to reinforce the palladium-palladium bonding interaction. This is the largest transition metal compounds that possess the planar nanosheet structure.

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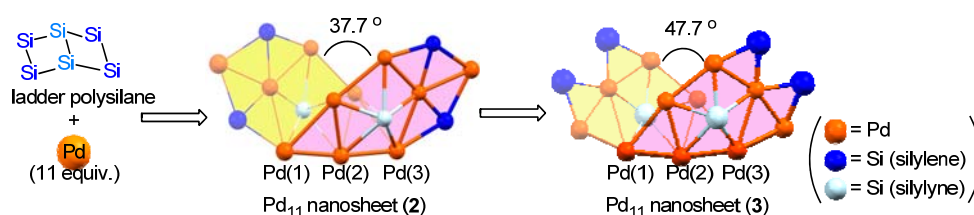


Figure 1. Preparation of Pd₁₁ nanosheet

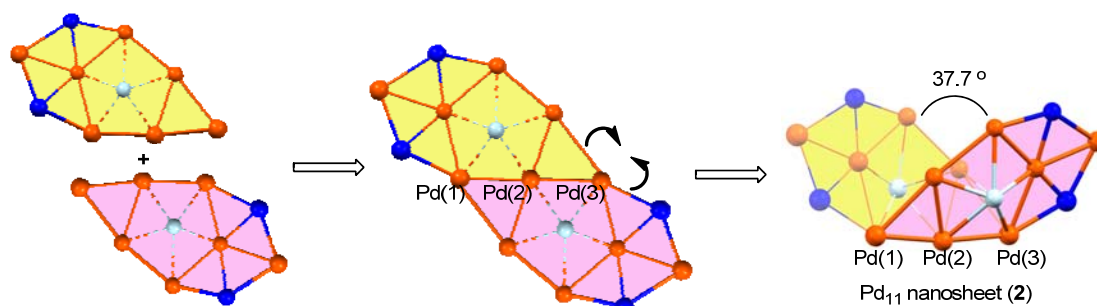


Figure 2. Conceptual scheme to construct the Pd₁₁ nanosheet

Publication

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