

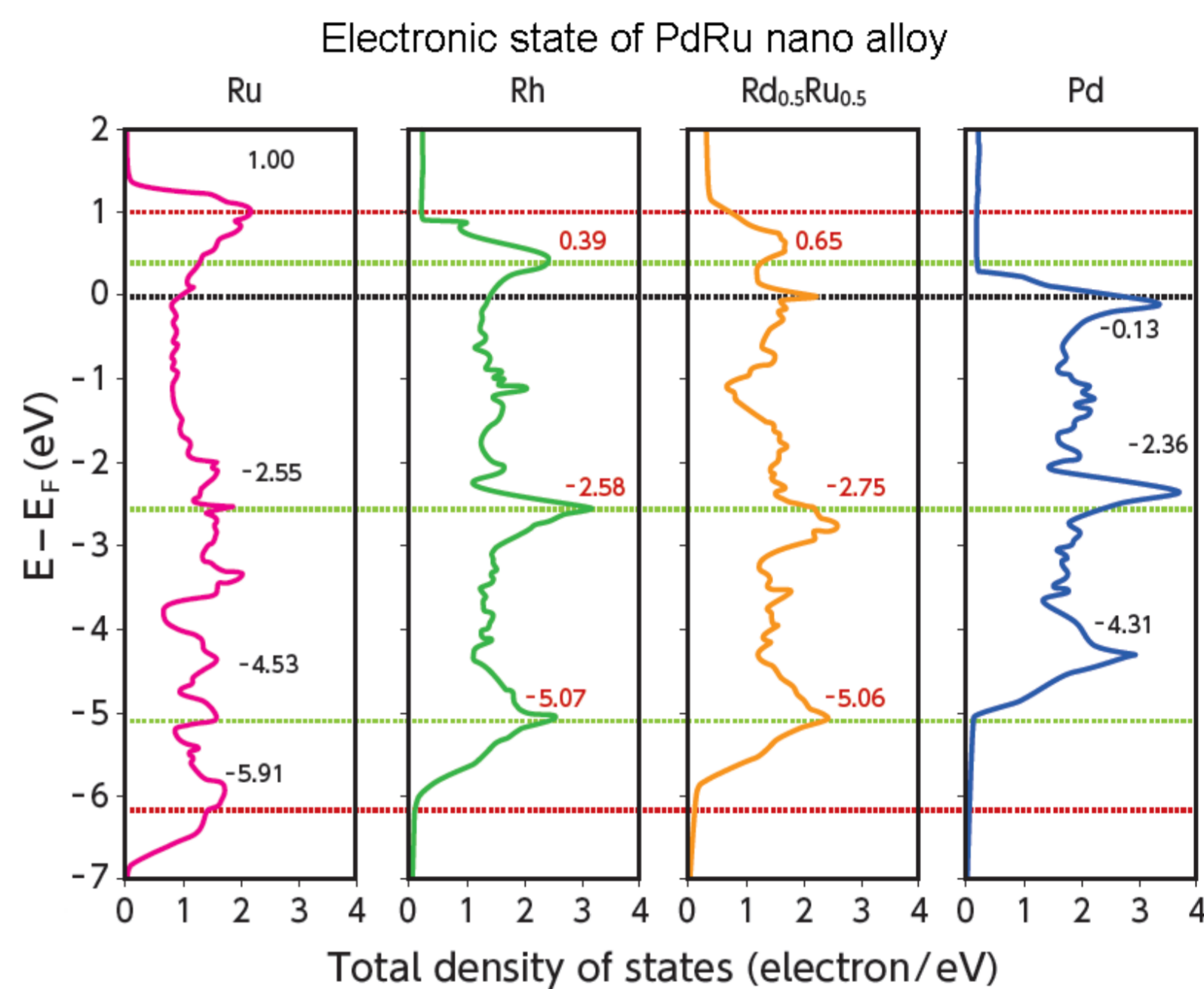
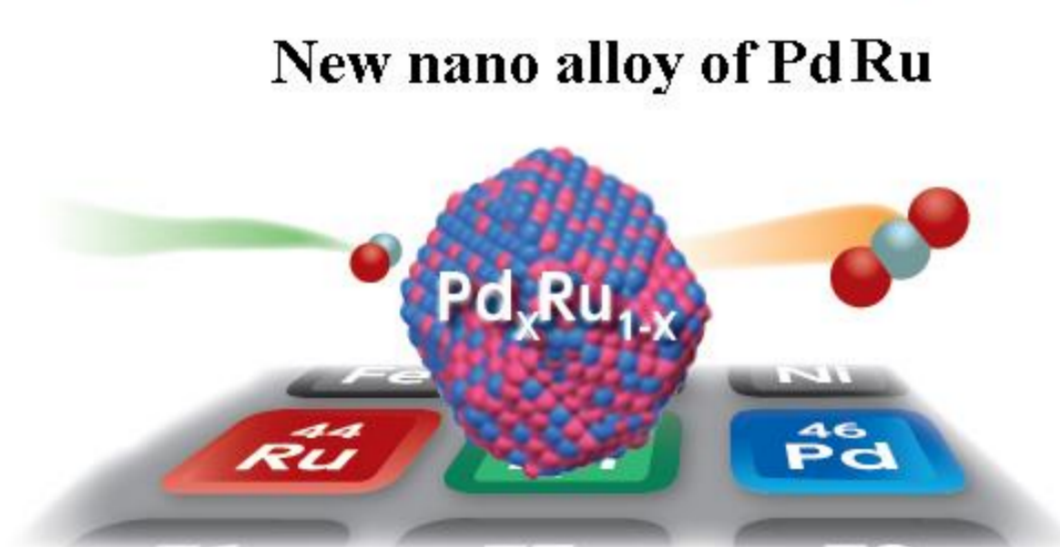
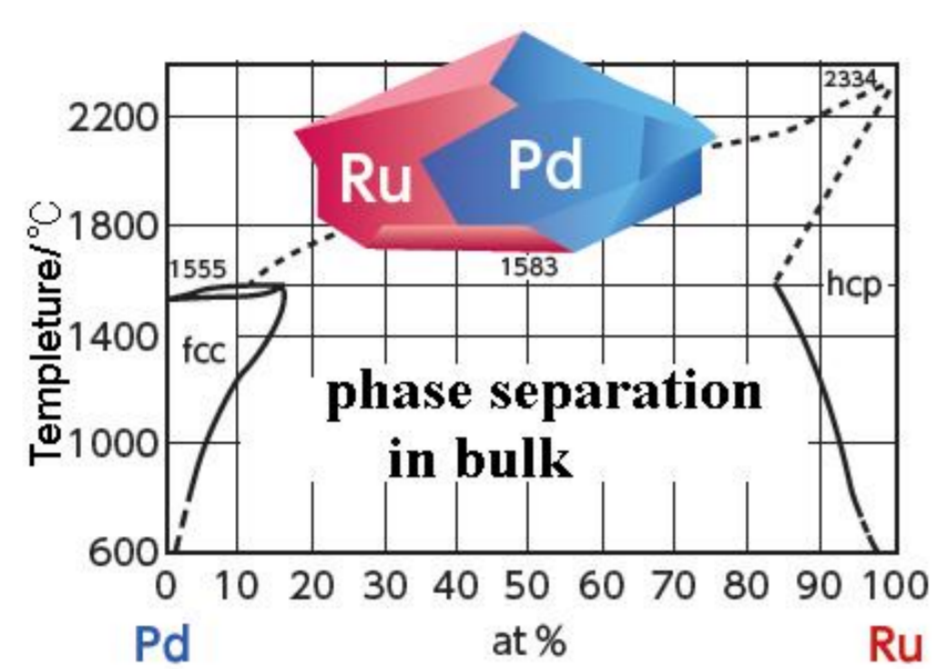
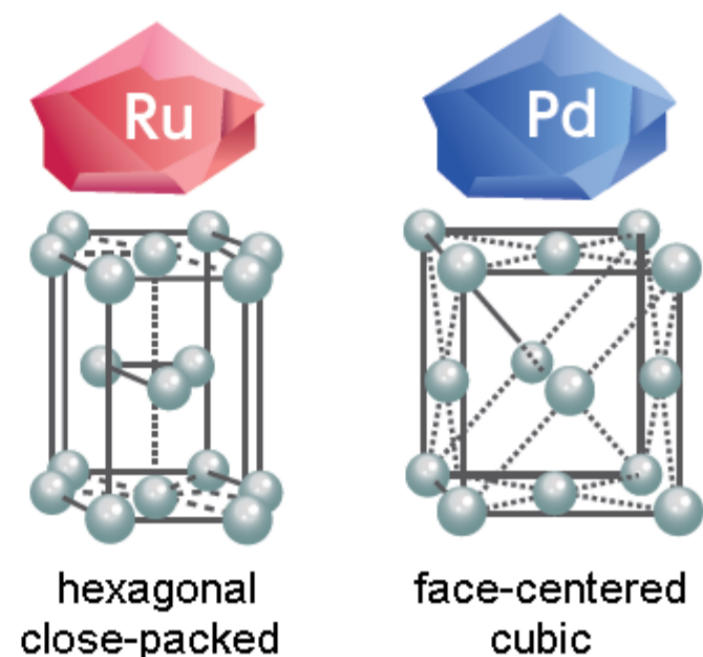
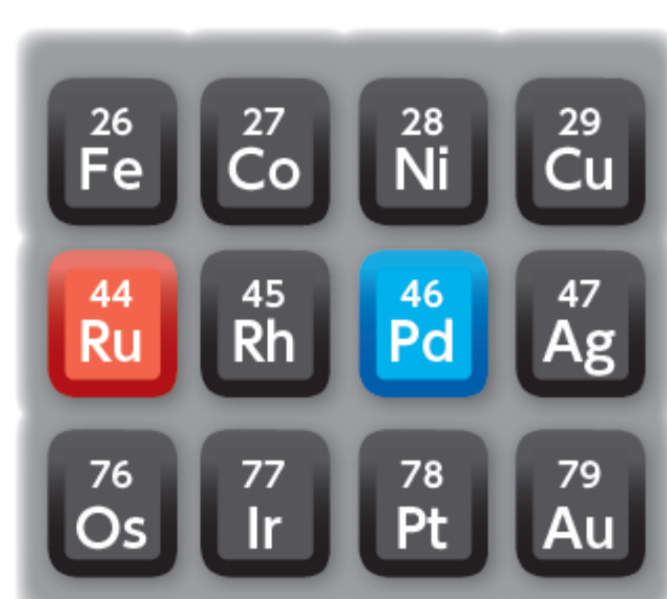
Novel Alloy replaces “rhodium(Rh)”

New “PdRu Nano-Alloy Material” created by Inter-Element-Fusion technology

Prof. Hiroshi KITAGAWA (Kyoto University)

1. New “PdRu Nano-Alloy Material” having the “Rh” properties

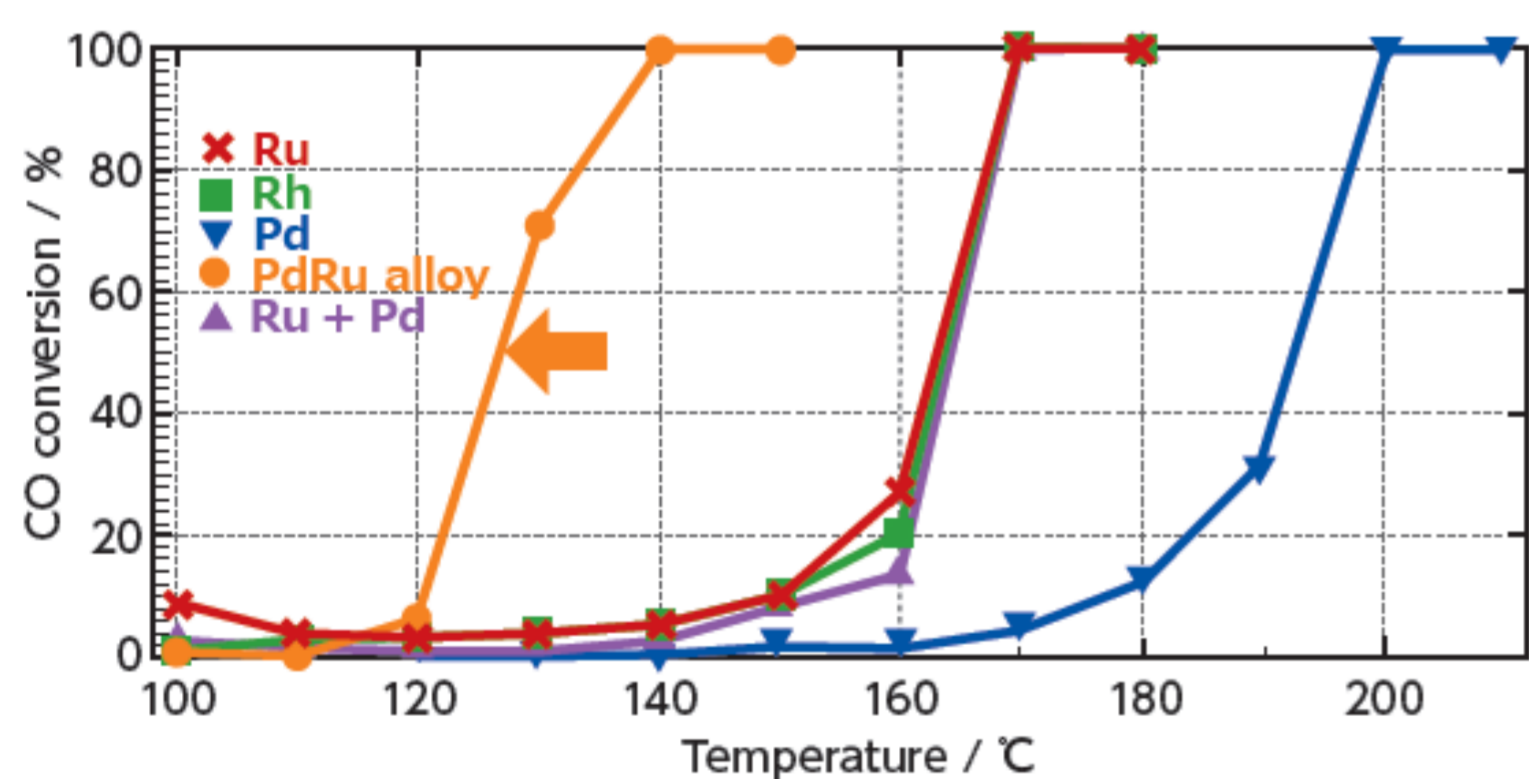
- ◆ The Nano-Alloy Material is created by the “Inter-Element-Fusion technology” to mix at the atomic level palladium (Pd) and ruthenium (Ru).
- ◆ The Nano-Alloy Material has superior properties than natural rhodium (Rh).
i.e. catalytic activities, lower reaction proceeding temperatures



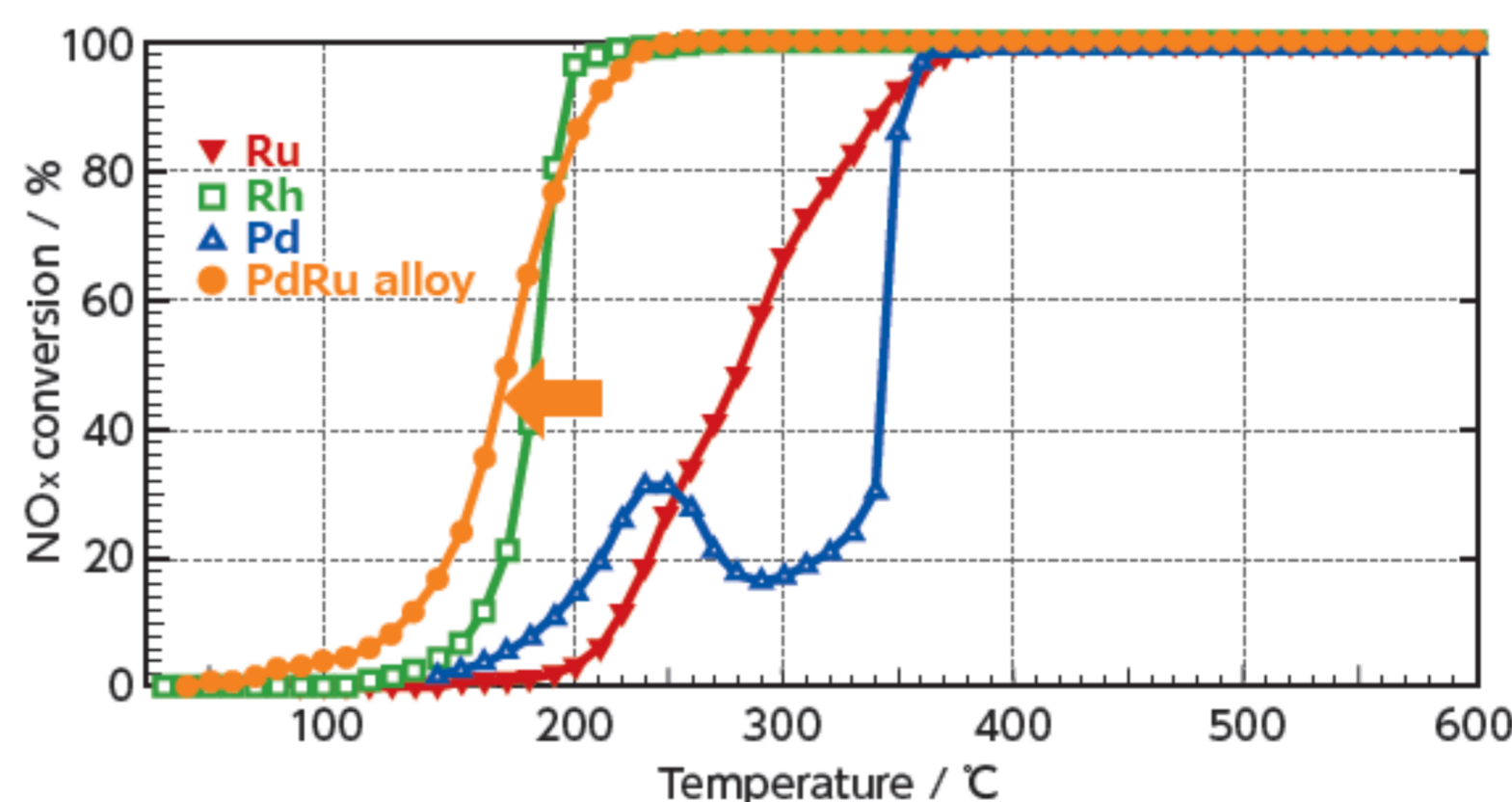
The tables show the electronic state patterns of Ru, Rh, the new “PdRu Nano-Alloy Material” and Pd (from the left to the right). The electronic state pattern of the new “PdRu Nano-Alloy Material” is very much similar to the pattern of Rh.

2. New “PdRu Nano-Alloy Material” used for Exhaust Gas Catalyst

◆ CO oxidation reaction

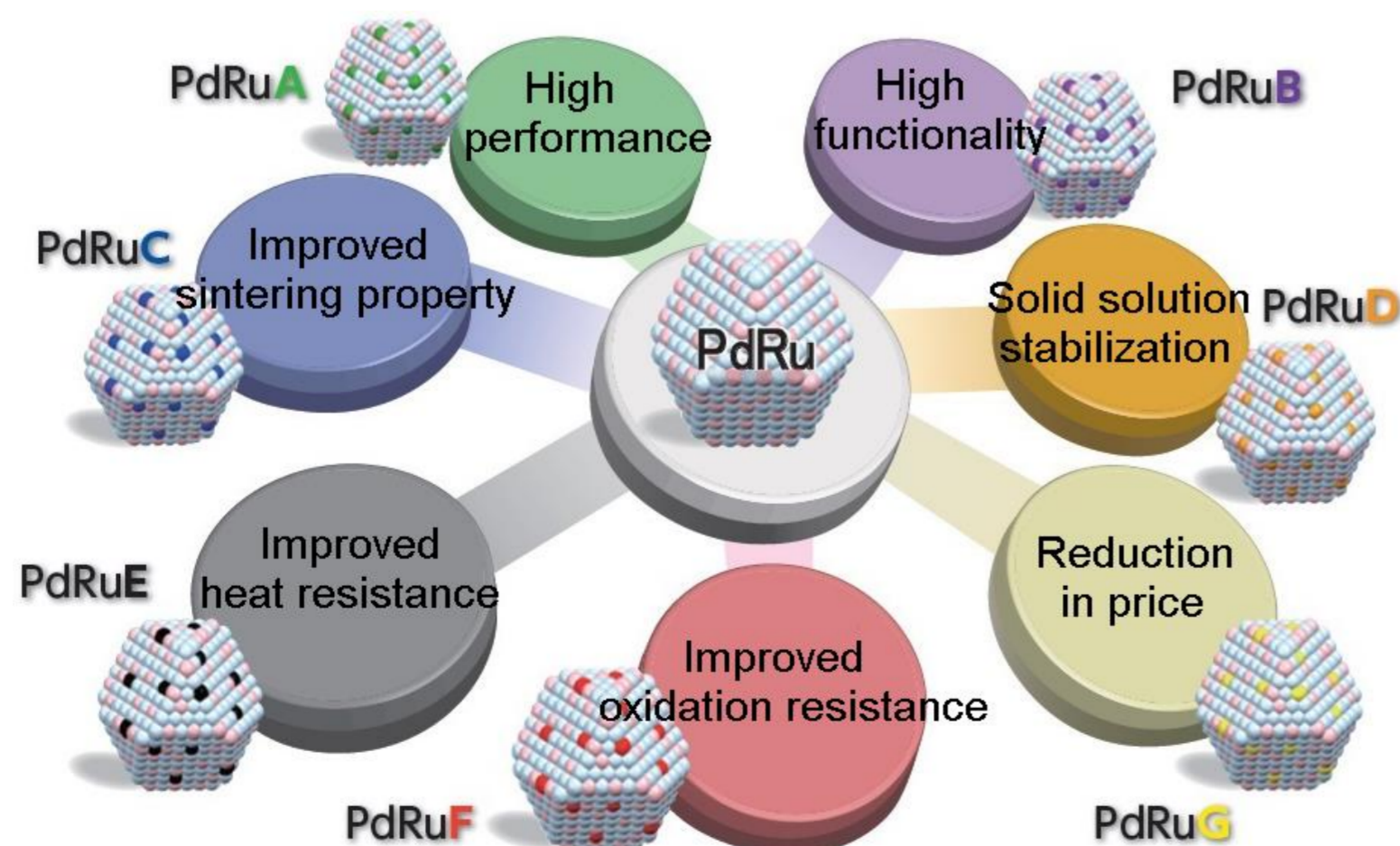


◆ NOx reduction reaction

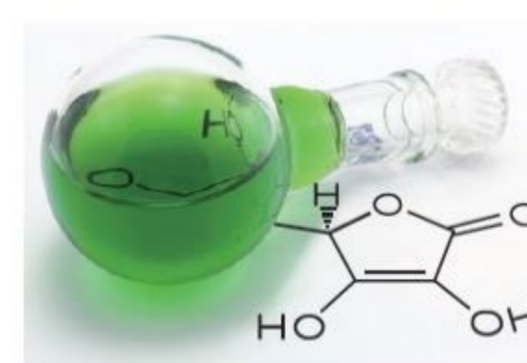


The New “PdRu” Nano-Alloy Material is now available to the market by Furuya Metal Co., LTD.

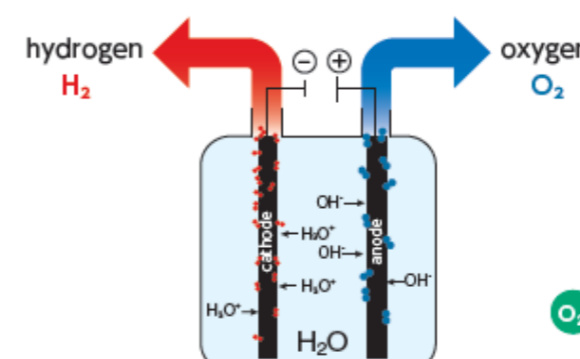
3. Great Potential of various new materials and their applications



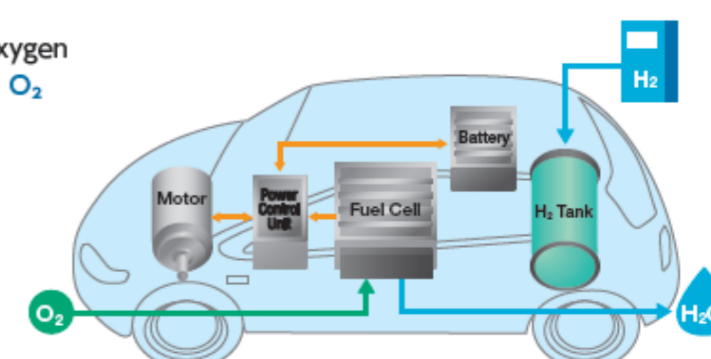
◆ Chemical catalyst



◆ Water electrolysis catalyst



◆ FC catalyst



4. Patent Licensing Available

Patent No.: WO2014/045570 Patent Family

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