Clear elemental maps of small nanoparticles can be acquired by combination of aberration correction, high sensitive EDX analysis, and low accelerating voltage measurement (80kV). Distribution of Pt shell thickness in Pd-Pt core-shell structure can be analyzed precisely.

### Aberration corrected STEM–EDX analysis

- Wide field BF-STEM image
- High resolution BF-STEM image
- High resolution HAADF-STEM image

### Precise analysis of core–shell structure

- Analysis procedure
  1. Preparing profiles of the number of Pd and Pt atoms with different shell thickness.
  2. Estimation of effective STEM probe size and convolution it to the profiles.
  3. Comparing with experimental results.

#### Experimental HAADF-STEM
- Intensity profile

#### Simulated image (2-layer)
- Intensity profile

#### Simulated image (3-layer)
- Intensity profile

#### Simulated image (4-layer)
- Intensity profile

The number of shell layers is determined in an atomic level by fitting core-shell models and experimental EDX profiles. *

* S. Inamoto, Y. Otsuka, K. Kobayashi (Daido univ.), M. Hori (Daido univ.), The 69th Annual Meeting of the Japanese Society of Microscopy.

### Evaluation by STEM image simulations

Results of the HAADF-STEM image simulations show the 3-layer model is similar to the experimental data.

Sample provided by Brookhaven National Laboratory