**Additional file**

**Facile aqueous-phase synthesis of Ag-Cu-Pt-Pd quadrometallic nanoparticles**

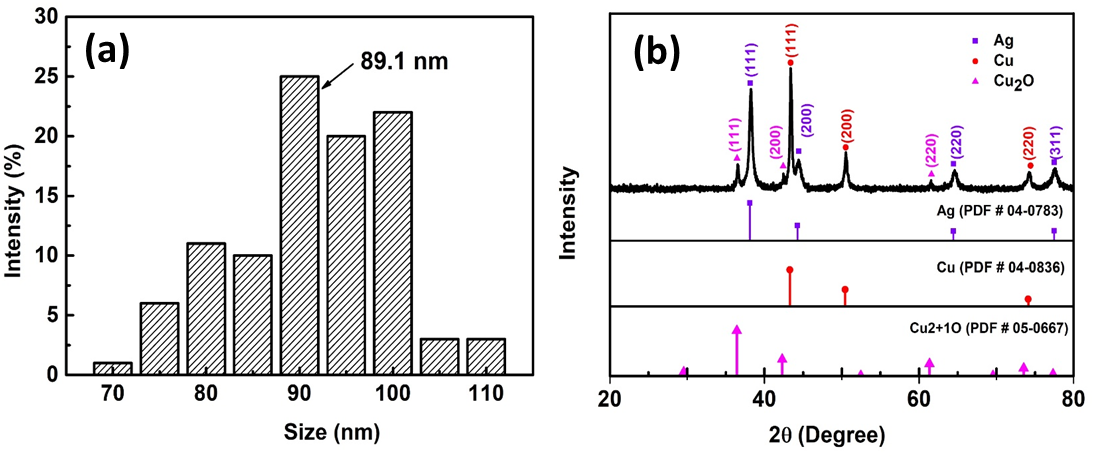
Zengmin Tang 1, Byung Chul Yeo 2, Sang Soo Han 2, Tae-Jin Lee3, Suk Ho Bhang3, Woo-Sik Kim 1,\*, Taekyung Yu 1,\*

*1 Department of Chemical Engineering, College of Engineering, Kyung Hee University, Yongin 17104, Republic of Korea*

*2 Center for Computational Science, Korea Institute of Science and Technology (KIST), Hwarangno 14-gil 5, Seongbuk-gu, Seoul 02792, Republic of Korea*

*3 School of Chemical Engineering, Sungkyunkwan University, Suwon 16419, Republic of Korea*

**\*** Correspondence: wskim@khu.ac.kr, tkyu@khu.ac.kr.



**Figure S1**. (a) size distribution of nanoparticles, (b) XRD patterns of synthesized Cu-Ag-Pt-Pd nanoparticles.

Table S1. ICP data of Cu-Ag-Pt-Pd nanoparticle

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | Metal | Mass concentration | percentage |
| Cu-Ag-Pt-Pd | Pd | 1.92 mg/L | 0.68% |
| Pt | 3.55 mg/L | 1.26% |
| Ag | 96.9 mg/L | 34.32% |
| Cu | 180 mg/L | 63.74% |

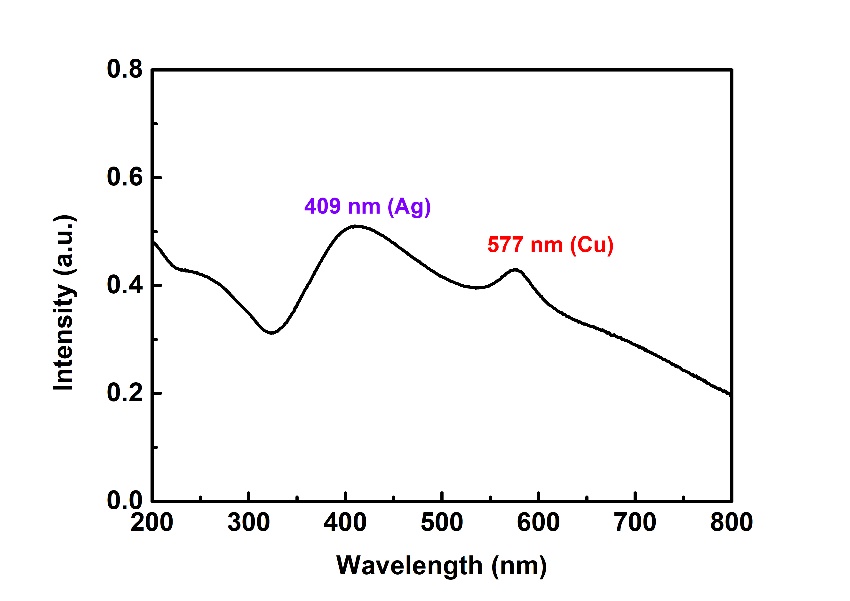


Figure S2. UV-vis spectrum of prepared Ag-Cu bimetallic nanoparticles.