# Electronic supplementary information (ESI)

# Propargylamines Formed from Three-Component Coupling Reactions Catalyzed by Silver Oxide Nanoparticles

**Xin Zhou, Yi Lu, Ling-Ling Zhai, Yue Zhao, Qing Liu and Wei-Yin Sun***

Coordination Chemistry Institute, State Key Laboratory of Coordination Chemistry, School of Chemistry and Chemical Engineering, Nanjing National Laboratory of Microstructures, Nanjing University, Nanjing 210093, China.

E-mail: sunwy@nju.edu.cn;

Fax: +86 25 8331 450

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**General Information**

All chemicals were purchased from Sigma-Aldrich without further purification. All reactions and purification of propargylamines were monitored by thin layer chromatography (TLC) using glass plates coated with silica gel using 90% petroleum ether and 10% ethyl acetate as an eluent. The isolated products were further purified by column chromatography using silica gel.

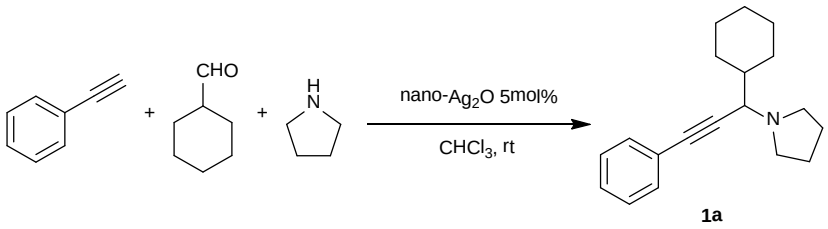
$^{1}H$ NMR and $^{13}C$ NMR spectra were recorded on a Bruker DRX 500 spectrometer in $CDCl_3$ using TMS as internal standard and chemical shifts are in δ. The electrospray (ES) mass spectral measurements were carried out on an LCQ System (Finnegan MAT, USA) using a mixing solution of methanol and water (1:1) as the mobile phase. Scanning electron microscopy (SEM) measurements were performed on a Hitachi S-4800 field emission scanning electron microscope at an accelerating voltage of 5 kV.

## Experimental Section

### General procedure for preparing propargylamines

In a 10 mL tube with a magnetic stirring bar, aldehydes (1.0 mmol), amines (1.1 mmol), phenylacetylene (1.2 mmol) and silver nanoparticles (0.050 mmol) were mixed, and stirred in solvents (2 mL) at room temperature for 10 hours. The progress of reaction was monitored by TLC. After completion of the reaction, the solution was filtered through silica gel in a pipette eluting with ethyl acetate. The solvents were removed *in vacuo* and the residue was purified by silica gel column chromatography (eluent: petroleum ether: ethyl acetate = 8: 1) to give the corresponding product. The silver nanoparticles were washed with ethanol, air-dried and reused directly for the next cycle of the reaction without further purification.

**Table S1** Optimization of the reaction time[a]




**1a**

| Entry | Time(h) | Yield(%)[b] | Entry | Time(h) | Yield(%)[b] |
|---|---|---|---|---|---|
| **1** | 2 | 18 | **5** | 9 | 75 |
| **2** | 4 | 39 | **6** | 10 | 79 |
| **3** | 6 | 60 | **7** | 11 | 79 |
| **4** | 8 | 70 | **8** | 12 | 79 |

[a] All reactions were carried with cyclohexanecarboxaldehyde (1.0 mmol), pyrrolidine (1.1 mmol), phenylacetylene (1.2 mmol) and silver nano-particles (0.050 mmol) in chloroform (2 mL) at room temperature in the air. [b] Isolated yield based on cyclohexanecarboxaldehyde.