Electronic Supplementary Material (ESI) for ChemComm.

– SUPPORTING INFORMATION –

Tungsten Nanoparticles from Liquid-Ammonia-based Synthesis

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1. Analytical tools

General: All analytical data and sample handling was performed under inert conditions (nitrogen or argon) in order to avoid contact to moisture.

Transmission electron microscopy (TEM): Transmission electron microscopy (TEM), high-resolution transmission electron microscopy (HRTEM) and selected area electron diffraction (SAED) were conducted with a Philips CM200-FEG microscope operating at 200 kV. TEM samples were prepared by evaporating suspensions in *n*-heptane on amorphous carbon (Lacey-)film suspended on copper grids. The deposition of the samples on the carbon (Lacey-)film copper grids was performed under Argon atmosphere in a glove-box. The grids were thereafter transferred with a suitable vacuum/inert gas transfer module into the transmission electron microscope without any contact to air. Average particle diameters were calculated by statistical evaluation of at least 150 particles (Scandium 5.0 software package, Soft Imaging Systems).

X-ray powder diffraction (XRD): X-ray powder diffraction (XRD) was performed with a Stoe STADI-P diffractometer operating with Ge-monochromatized Cu-Kα-radiation (λ = 1.54178 Å) and Debye-Scherrer geometry.

Infrared Spectroscopy (FT-IR): Fourier-transform infrared spectra were recorded on a Bruker Vertex 70 FT-IR spectrometer using KBr pellets.

Optical spectroscopy (UV-VIS): Optical spectroscopy of the as-prepared W^0 nanoparticles was performed by dropping suspensions in *n*-heptane on optical grade $BaSO_4$ powder. This procedure was conducted in a glove box to exclude oxygen and water impurities. After evaporation of the *n*-heptane, the greyish orange powder sample was filled in a special sample holder that was finally locked by a quartz glass plate. Afterwards, the diffuse reflectance was recorded in a wavelength interval of 250-800 nm with a Varian Cary 100 spectrometer, equipped with an integrating sphere. Pure $BaSO_4$ was measured as a reference.

2. FT-IR spectroscopy

The presence of oleylamine as a surface capping on the as-prepared W^0 nanoparticles is validated by Fourier-transform infrared spectroscopy (FT-IR, *Fig. S1*). Here, the characteristic vibrations of oleylamine are visible (ν(C–H): 2950-2850 cm^{-1}; ν(N–H): 3500-3300 cm^{-1}; δ(N–H): 1608 cm^{-1}; δ(N–C): 1052 cm^{-1}). Pure oleylamine is shown as a reference.

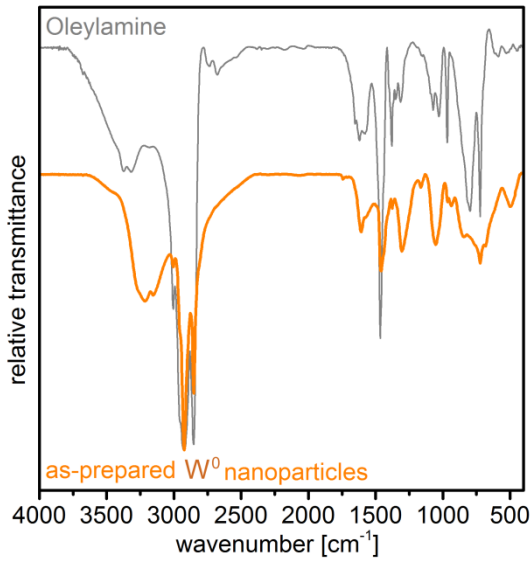

Figure S1. FT-IR spectra of the as-prepared W^0 nanoparticles with pure oleylamine as a reference.