

**New insight into the mechanism of the Ag, Au and AgAu
nanoparticles formation in aqueous alkaline media:
alkoxides from alcohols, aldehydes and ketones as the
universal reducing agent**

Janaina F. Gomes,^{*} Amanda C. Garcia, Eduardo B. Ferreira, Cleiton Pires,
Vanessa L. Oliveira, Germano Tremiliosi-Filho and Luiz H. S. Gasparotto[†]

*Instituto de Química de São Carlos, Universidade de São Paulo,
Caixa Postal 780, 13560-970, São Carlos, SP, Brazil*

Supporting Information

^{*} *Current address: Departamento de Engenharia Química, Universidade Federal de São Carlos, 13565-905, São Carlos, SP, Brazil*

[†] *Current address: Instituto de Química, Universidade Federal do Rio Grande do Norte, Lagoa Nova, 59078-970, Natal, RN, Brazil*

*Corresponding authors: Dr. Janaina Fernandes Gomes (janainafg@ufscar.br)
+55 16 3351-8921. Dr. Luiz H. S. Gasparotto (lhgasparotto@ufrnet.br)*

Figure captions

SI 1 - UV-vis spectra of the colloidal Au-Nps produced with 0.50 mol L⁻¹ methanol, 0.010 mol L⁻¹ NaOH, 10 g L⁻¹ PVP and 0.40 mmol L⁻¹ AuCl₃ at 25 °C.

SI 2 – UV-vis spectra of the colloidal Au-Nps produced with 0.50 mol L⁻¹ dihydroxyacetone (black line) or 10 g L⁻¹ PVP (blue line), 0.010 mol L⁻¹ NaOH and 0.40 mmol L⁻¹ AuCl₃ at 25 °C.

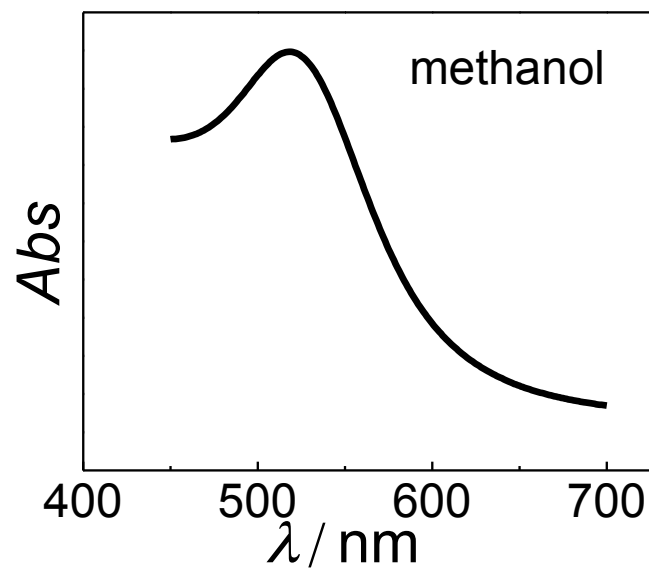
SI 3 – HPLC results of glyoxylic acid, hydroxypyruvic acid, dihydroxyacetone, glyceraldehyde, mesoxalic acid, formic acid, glycolic acid, glyceric acid, tartronic acid and oxalic acid in NaOH solution.

SI 4 – HPLC results of 0.01 mol L⁻¹ glycerol in 0.01 mol L⁻¹ NaOH and chromatograms taken at 1 min., 30 min. and 60 min. after exposing the Ag/C to 0.01 mol L⁻¹ glycerol in 0.01 mol L⁻¹ NaOH.

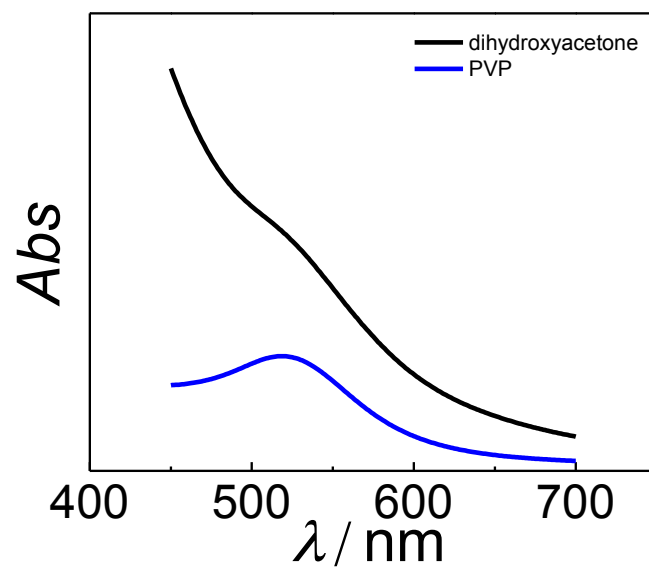
SI 5 – HPLC result of 0.01 mol L⁻¹ glycerol in 0.01 mol L⁻¹ NaOH (bottom), chromatogram taken at 60 min. after exposing the Au/C to 0.01 mol L⁻¹ glycerol in 0.01 mol L⁻¹ NaOH (middle) and chromatogram taken at 60 min. after Au nanoparticles synthesis (top).

SI 6 – X-ray diffraction (XRD) pattern of the Au/C, Ag/C and AuAg/C. Condition of synthesis: 0.40 mmol L⁻¹ AuCl₃ (in the case of Au nanoparticles), 0.40 mmol L⁻¹ AgNO₃ (in the case of Ag nanoparticles), 1.0 mol L⁻¹ glycerol and 0.10 mol L⁻¹ NaOH. For the bimetallic nanoparticles the Au³⁺ and Ag⁺ final concentrations were both 0.20 mmol L⁻¹.

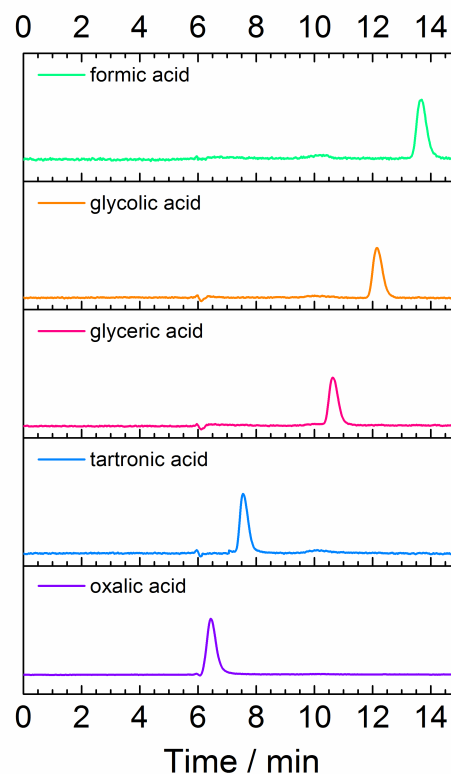
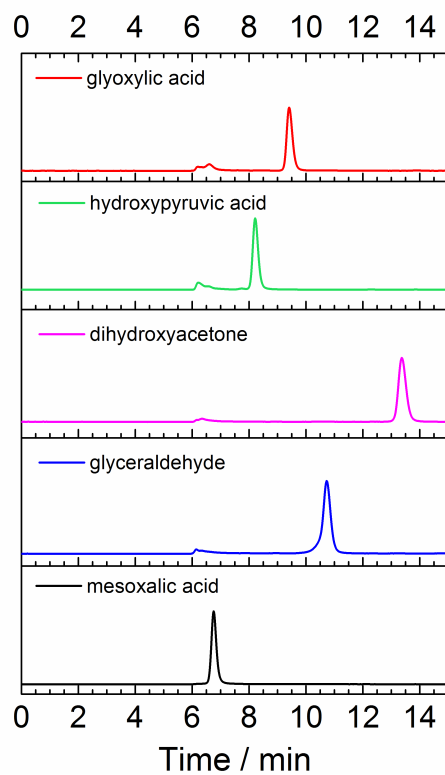
SI 1



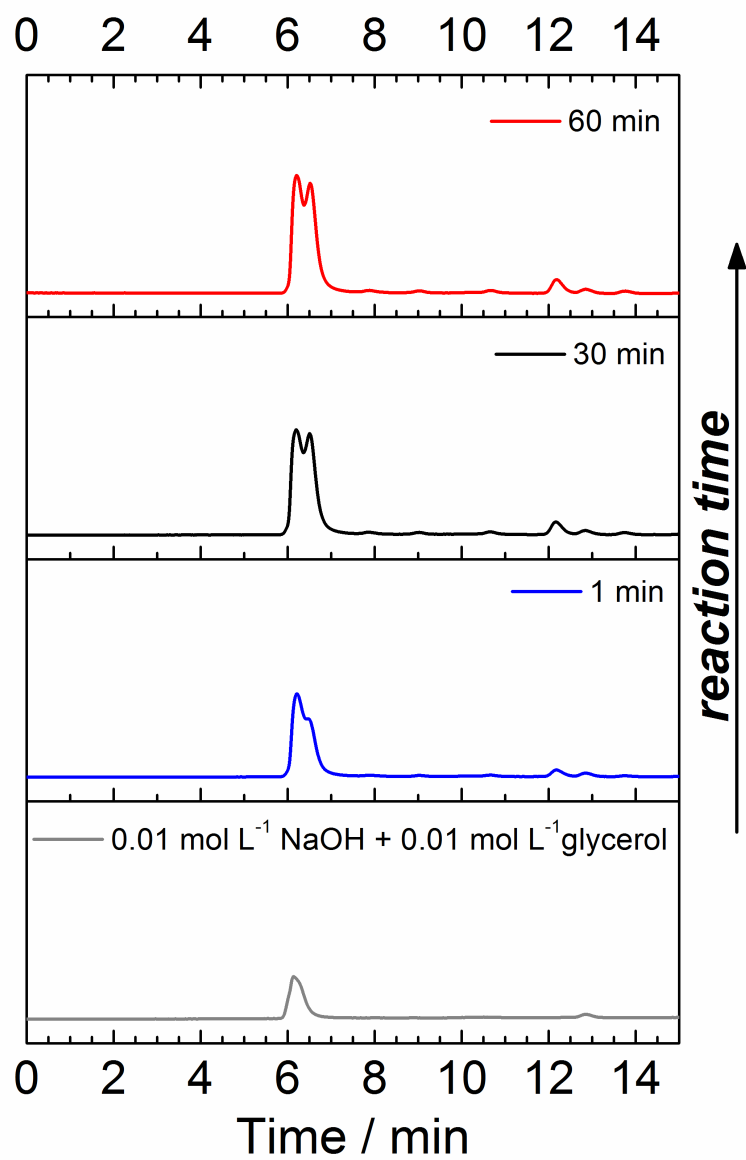
SI 2



SI 3



SI 4



SI 5

