Supplementary Information

A remarkable anion effect on palladium nanoparticle formation and stabilization in hydroxyl-functionalized ionic liquids

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FT-IR analysis

Samples

1) [C$_2$OHmim][Tf$_2$N].
2) Pd(OAc)$_2$ (0.1 mM) dissolved in [C$_2$OHmim][Tf$_2$N].
3) Pd NPs (0.1 mM) dispersed in [C$_2$OHmim][Tf$_2$N], prepared by thermal decomposition of Pd(OAc)$_2$ at 393 K for 30 min with rapid stirring.
Fig S1 FT-IR spectroscopy of [C\text{2OHmim}]\text{[Tf}_2\text{N}], Pd(OAc)\text{2-[C}_2\text{OHmim}]\text{[Tf}_2\text{N}] and Pd NPs-[C\text{2OHmim}]\text{[Tf}_2\text{N}] left) full spectra; and right) the C=O band region. Spectra were recorded on a Perkin Elmer Spectrum (600-4000 cm\textsuperscript{-1}) installed with the ATR accessory (IR-ATR).

The IR spectra reveal: 1) the decomposition of Pd(OAc)\text{2 was complete, as the characteristic absorption band at ca. 1600 cm\textsuperscript{-1} disappears after thermal decomposition; and 2) [C\text{2OHmim}] does not act as the reductant as no new absorption band for a C=O functionality was observed after the formation of Pd NPs.

**NMR analysis of the ionic liquids**

NMR spectra of the ionic liquid dissolved in CD\textsubscript{3}CN were obtained at 20°C with a Bruker AVANCE-400 instrument.
[C$_2$OHmim][BF$_4$]
$[\text{C}_2\text{OHmim}][\text{PF}_6]$
$[\text{C}_2\text{OHmim}][\text{OTf}]$
[C$_2$OHmim][Tf$_2$N]
$[\text{C}_4\text{mim}][\text{Tf}_2\text{N}]$
References

