Supporting Information

Green Fabrication of Hydrogel-Immobilized Au@Ag Nanoparticles Using Tannic Acid and Application in Catalysis

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Figure S1. Diameter statistic of (A) AuNPs, (B) AgNPs, and (C) Au@AgNPs used Nano Measurer 1.2.

Table S1. DLS results of three kinds of NPs

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<thead>
<tr>
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<th>Mean diameter (nm)</th>
<th>Zeta potential (mV)</th>
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<tbody>
<tr>
<td>AuNPs</td>
<td>21</td>
<td>-20.8</td>
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<tr>
<td>AgNPs</td>
<td>18</td>
<td>-30.1</td>
</tr>
<tr>
<td>Au@AgNPs</td>
<td>32</td>
<td>-23.2</td>
</tr>
</tbody>
</table>

Figure S2. The hole sizes of different PVA/TA hydrogels.
**Figure S3.** Tensile strength of (A) PVA/0TA hydrogel, (B) PVA/1TA hydrogel, (C) PVA/2TA hydrogel, and (D) PVA/3TA hydrogel after being soaked in different kinds of saturation salt solution.

**Figure S4.** Photographs of A) PVA+TA mixture without any treatment and B-E) PVA+TA mixture treated with different repeated number freeze-thaw.
Figure S5. UV-vis. spectra of hydrogels soaking liquid after urea treated 72 h.

Figure S6. Original images of EDS mapping. (A) PVA/1TA-Au hydrogel and (B) PVA/1TA-Au@Ag hydrogel.

Figure S7. UV-vis. spectrum of 2-NP aqueous solution.