

1 **Supporting Information**

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4 **Synthesis of Ni/Au/Co Trimetallic Nanoparticles and Their Catalytic Activity for Hydrogen**

5 **Generation from Alkaline Sodium Borohydride Aqueous Solution**

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- 6 R<sub>NaBH<sub>4</sub></sub>=5, R<sub>PVP</sub>=100).
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- 16 Fig. S6 XPS core level spectra of Au, Co and Ni recorded from Ni<sub>50</sub>Au<sub>10</sub>Co<sub>40</sub> TNPs ([M<sup>n+</sup>]= 0.66
- 17 mM, R<sub>NaBH<sub>4</sub></sub>=5, R<sub>PVP</sub>=100).

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Table S1

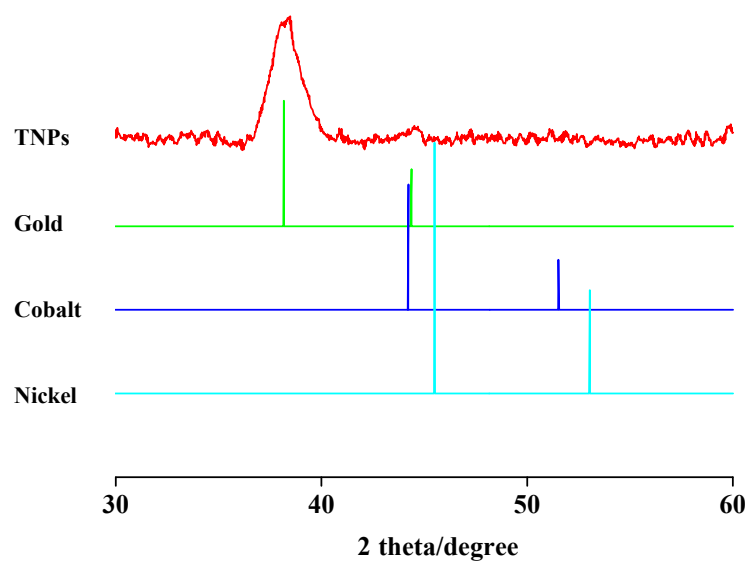
Faces	Au/degree	Co/degree	Ni/degree	Peak of Ni <sub>45</sub> Au <sub>45</sub> Co <sub>10</sub> TNPs
111	38.179	44.20	45.50	38.179< <b>38.42</b> <44.20 (45.50)
200	44.375	51.52	53.05	44.375< <b>44.68</b> < 51.52 (53.05)

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Table S2

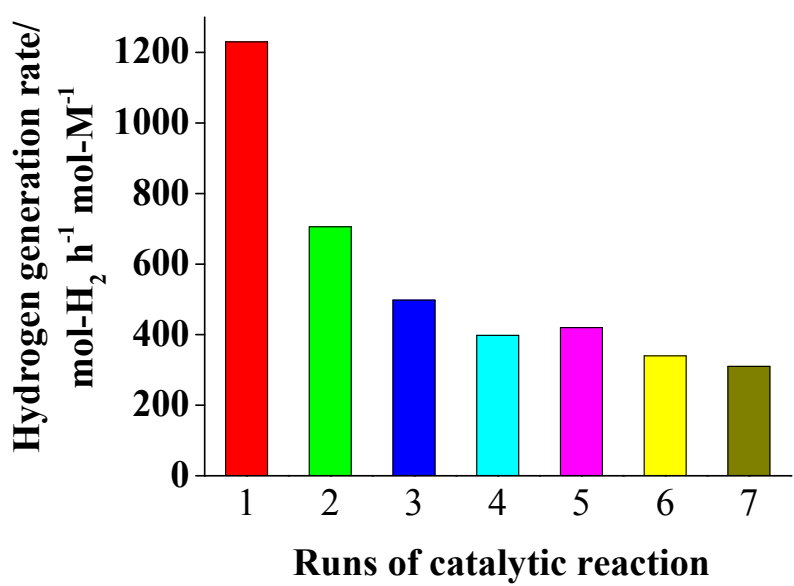
NPs with varied composition		UV-Vis peak /nm	Catalytic activity /mol-H <sub>2</sub> /(h·mol-M)
MNPs	Au	520	150
	Ni	-	110
	Co	-	80
BNPs	Ni <sub>50</sub> Au <sub>50</sub>	492	800
	Co <sub>50</sub> Au <sub>50</sub>	492	380
	Ni <sub>50</sub> Co <sub>50</sub>	-	80
TNPs	Ni <sub>50</sub> Au <sub>10</sub> Co <sub>40</sub>	506	790
	Ni <sub>50</sub> Au <sub>30</sub> Co <sub>20</sub>	508	760
	Ni <sub>30</sub> Au <sub>30</sub> Co <sub>40</sub>	492	530
	Ni <sub>35</sub> Au <sub>35</sub> Co <sub>30</sub>	500	500
	Ni <sub>40</sub> Au <sub>40</sub> Co <sub>20</sub>	501	1030
	Ni <sub>45</sub> Au <sub>45</sub> Co <sub>10</sub>	509	1170

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Fig. S1



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Fig. S2

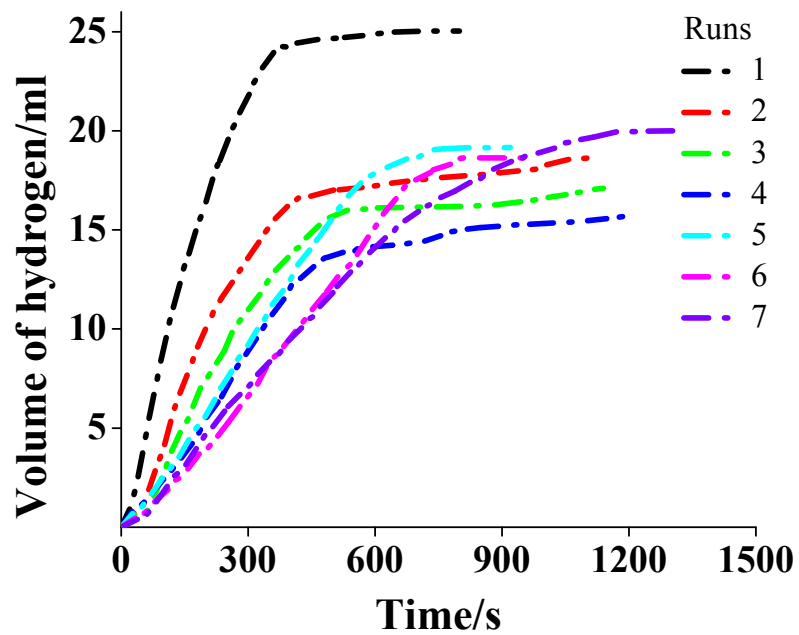


Fig. S3

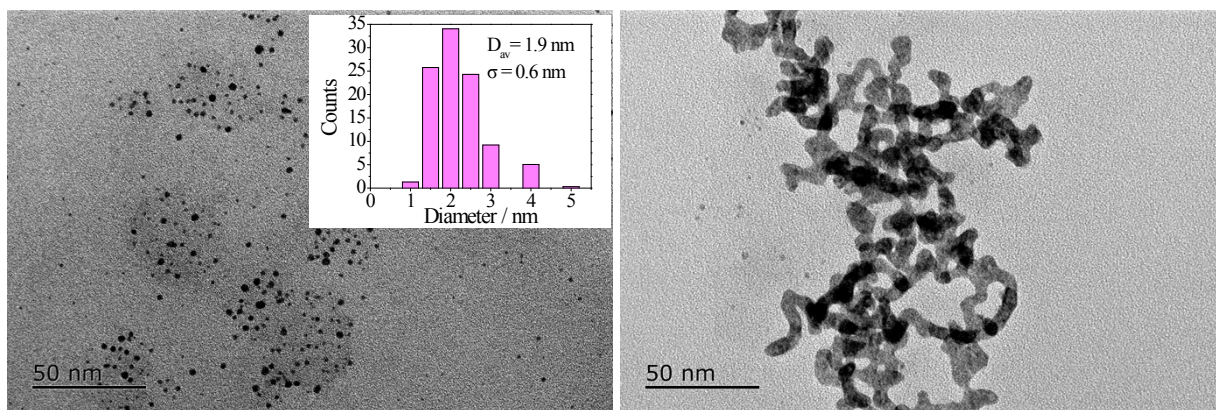


Fig. S4

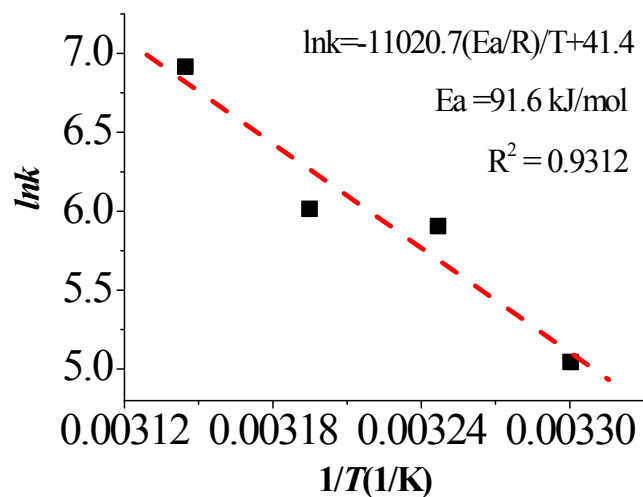


Fig. S5

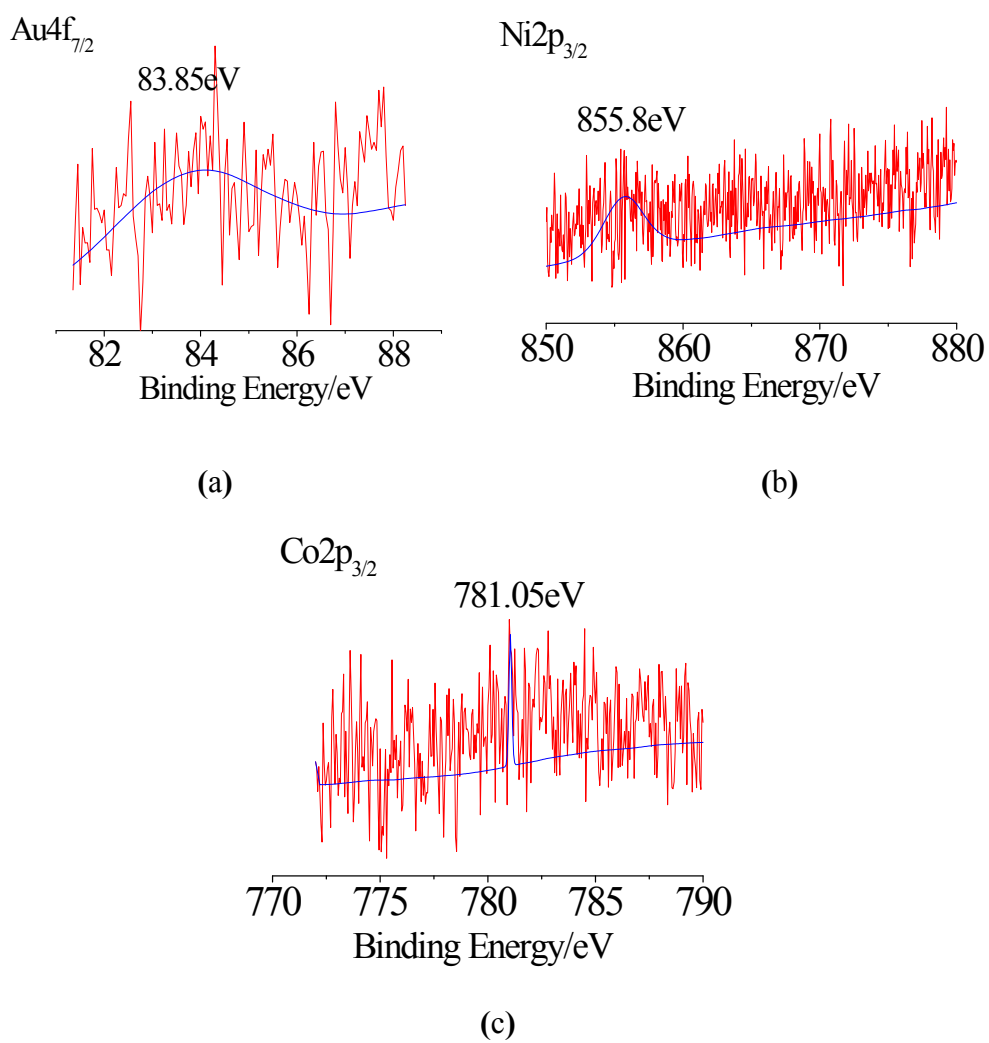


Fig. S6