Supporting information

**Fig S1.** (a) ECL intensity-potential curve of gold electrode in 67 mmol L\(^{-1}\) PBS (pH 4.0) containing 1 mmol L\(^{-1}\) Ru(bpy)\(_3\)\(^{2+}\) under continuous CV. (b) ECL intensity-potential curve of Ru(bpy)\(_3\)\(^{2+}\) in 67 mmol L\(^{-1}\) PBS (pH 4) containing TPrA under continuous CV.

**Fig S2.** SEM images of different sizes and shapes of AuNPs on the electrode with different deposition time (10s, 30s, 60s).

**Fig S3.** Cyclic voltammograms of different sizes and shapes AuNPs film modified Pt electrode in 1 mmol L\(^{-1}\) K\(_3\)Fe(CN)\(_6\) with different deposition time (s ~ d-0s, 10s, 30s, 50s, 60s). Scan rate: 100 mV s\(^{-1}\).

**Fig S4.** (a) ECL intensity-pH curve for reaction of Ru(bpy)\(_3\)\(^{2+}\) with AuNPs film in the acid PBS. (b) ECL intensity-pH curve for reaction of TPrA for the resulting electrode covered a Nafion film after reaction of Ru(bpy)\(_3\)\(^{2+}\) with AuNPs in the alkaline PBS.
Fig S1.

![Graph showing ECL intensity vs. Potential/V](image)

Fig S2.

![Images showing material surface at different times](images)
Fig S3.

![Graph showing current vs. potential for different times]  

Fig S4.

![Graph showing ECL intensity vs. pH for two different pH ranges]