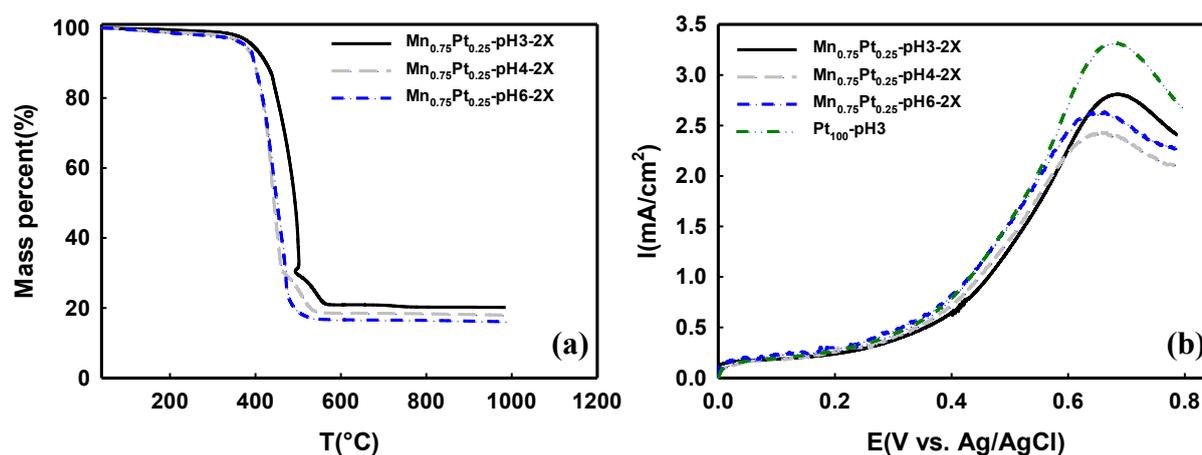


## Supplementary Information

Figure S1 shows that increasing the pH of the impregnation solution above three resulted in the metal loading decreasing from 20.1 down to 16.1%. As a consequence, the electrochemical activity of the sample was reduced, and different trends were seen from sample to sample at higher pHs. Moreover, a lower combustion temperature was observed for samples produced at higher pHs, which indicates that the particle sizes were reduced, although the EOR activity was lower. The EOR activity of the samples showed a behavior similar to pure Pt. We believe that at higher pHs, there is a stronger interaction between the citrate ions and  $\text{Mn}^{2+}$  ions in the precursor solution, which hinders their deposition. Therefore, a different behavior was observed for these samples, and as a result, in this paper, all of the samples have been produced at pH 3.



**Figure S1.** (a) TG in air and (b) LSV in the 0.5 M  $\text{H}_2\text{SO}_4$  + 0.1 M ethanol solution at a scan rate of 20 mV/s for Pt-Mn alloys which were synthesized on Vulcan carbon support in the presence of sodium citrate at different pHs.