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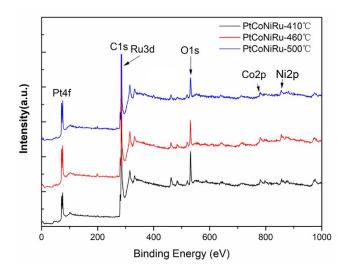


Figure S1. The XPS survey spectra of three PtCoNiRu/C samples sintered at 410 $^{\circ}$ C, 460 $^{\circ}$ C and 500 $^{\circ}$ C

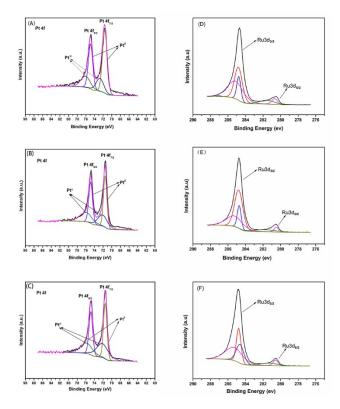


Figure S2. Curve fiting of XPS spectra for Pt4f (A), (B), (C) and Ru3d (D),(E),(F) of three PtCoNiRu/C sintered at 410 °C, 460 °C, 500 °C, respectively

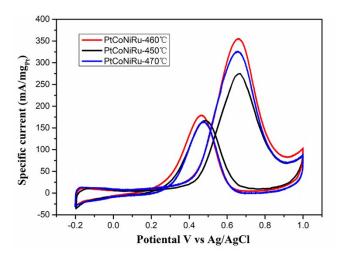


Figure S3. Cyclic voltammograms for methanol electro-oxidation in solution containing 0.5 M $H_2SO_4 + 0.5M$ C H_3OH on PtCoNiRu/C sintered at 450 °C, 460 °C, 470 °C, respectively with the scanning rate of 0.05 V s $^{-1}$

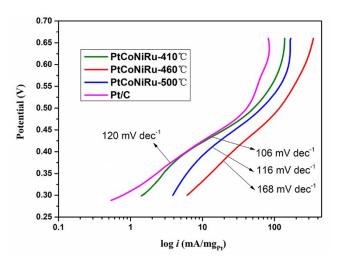


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