Figure S1† Distribution of Ru oxidation state for various binary Ru-Ti oxides, Ru metal and RuO$_2$ are used as reference samples.
Figure S2† Fitting results of (a) Ru and (b) Ti K-edge EXAFS spectra for the standard RuO$_2$, rutile TiO$_2$ and various binary Ru-Ti oxides.
Figure S3† HR-TEM morphologies and the corresponding electron diffraction patterns for (a-c) RuTi-200 and (d-f) RuTi-300. The clear lattice fringe and diffraction point of RuTi-H300 indicates an increased crystallinity characteristic and the formation of long-range order structure.
Figure S4† HR-TEM image measured at the high angle annular dark field (HAADF) mode and the corresponding EDS mapping results of RuTi-300. The red and yellow spots shown in the mapping profile stand for Ru and Ti elements, respectively. It can be clearly seen that a small amount of Ti element exists inside the RuO$_2$ nanorods. The calculated Ru/Ti atomic ratio is approximately 96.2/3.8 (The intensity of Ti is lower than that of Ru).
Figure S5† TEM morphologies for (a) Ru-as, (b) Ru-150, (c) Ru-200, (d) Ru-250, (e) Ru-300, and (f) Ru-300 samples.
Figure S6† Electrochemical impedance spectra of (a) RuO$_2$ and (b) RuTiO$_2$ nanocomposites annealed at various temperatures. EIS results were measured at 0.5 V in 0.5 M H$_2$SO$_4$. Inset shows the spectra in the high-frequency region.
Figure S7† Frequency dependence of specific capacitance for RuO₂ and (Ru-Ti)O₂ electrode annealed at various temperatures (0.5±0.02 mg cm⁻²). The results were measured at 0.5 V and the electrolyte for the electrochemical measurements is 0.5 M H₂SO₄.