The imperative for addressing environmental and energy challenges underscores the significance of advancing sustainable and renewable energy sources, as well as the development of efficient energy storage and conversion technologies. An increasingly promising approach involves combining electrochemical water splitting with large-scale renewable energy capture methods. Hydrogen, recognized for its highest mass-energy density among all fuels, stands out as the ultimate clean energy carrier. Realizing practical water splitting hinges on the creation of cost-effective, highly effective, and long-lasting catalysts for hydrogen evolution reactions (HERs) and oxygen evolution reactions (OERs). Recently, heterostructure catalysts, typically composed of electrochemically active materials and various functional additives, have displayed remarkable electrocatalytic performance in both HER and OER. Notably, several of these precious-metal-free heterostructures have exhibited comparable activity levels to catalysts reliant on precious metals. Here is reported a facile reflux method was used to synthesized $CoWSe_2$/h-BN nanocomposites for enhancing electrocatalytic activity for OER and HER. The formation of $CoWSe_2$/h-BN was confirmed by XRD. Further electrochemical analysis $CoWSe_2$/h-BN was carried in 1M KOH solution in both OER and HER. There are two methods for electrode deposition 1. sequential ,2. One pot deposition. Electrochemical studies were performed which exhibit high current density for electrode having sequential deposition. Highly electrocatalytic $CoWSe_2$/h-BN exhibit lower overpotential -1.4V and -07 V at current density 10mAcm^{-2} having Tafel slope -0.16 and 0.072 V for HER and OER respectively. The EIS of $CoWSe_2$/h-BN was performed it exhibit charge transfer resistance value of 2.1Ω and 0.7 Ω for HER and OER respectively. Hence the synthesized composite $CoWSe_2$/h-BN is a better choice for bifunctional electrocatalysis.