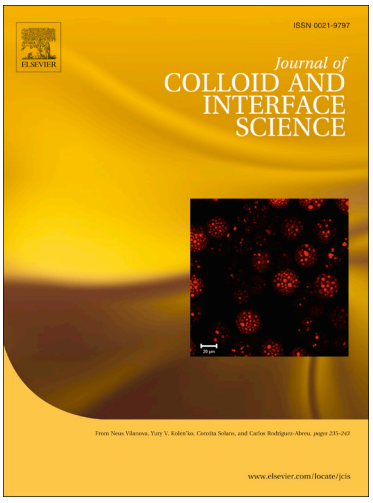

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Abstract

In this paper, platinum nanoparticles were deposited on a carbon carrier with the partly graphitized carbon and the highly dispersive carbon-coated nickel particles. An efficient electron transfer structure can be fabricated by controlling the contents of the deposited platinum. The high resolution transmission electron microscopy images of $Pt_2/Ni@C_{N\text{-}doped}$ sample prove the electron transfer channel from Pt (111) crystal planes to graphite (100) or Ni (111) crystal planes due to these linked together crystal planes. The $Pt_3/Ni@C_{N\text{-}doped}$ with low Pt contents cannot form the electron transfer structure and the $Pt_1/Ni@C_{N\text{-}doped}$ with high Pt contents show an obvious aggregation of Pt nanoparticles. The electrochemical tests of all the catalysts show that the