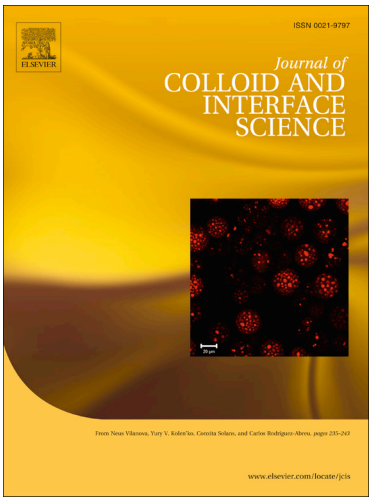

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PII: S0021-9797(17)31319-X
DOI: https://doi.org/10.1016/j.jcis.2017.11.026
Reference: YJCIS 23013

To appear in: *Journal of Colloid and Interface Science*

Received Date: 4 September 2017
Revised Date: 1 November 2017
Accepted Date: 8 November 2017

Please cite this article as: Q. Liu, Y-M. He, X. Weng, A-J. Wang, P-X. Yuan, K-M. Fang, J-J. Feng, One-pot aqueous fabrication of reduced graphene oxide supported porous PtAg alloy nanoflowers to greatly boost catalytic performances for oxygen reduction and hydrogen evolution, *Journal of Colloid and Interface Science* (2017), doi: https://doi.org/10.1016/j.jcis.2017.11.026

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Abstract

Herein, reduced graphene oxide supported porous PtAg alloy nanoflowers (PtAg NFs/rGO) were synthesized by a simple one-pot aqueous method using pyridinium-based dicationic ionic liquid (1,4-bis(pyridinium)butane dibromide, Bpb-2Br) as the new structure-director and stabilizing agent. The products were characterized by a series of techniques. The obtained nanocomposite had more positive onset potential (1.03 V) for oxygen reduction reaction (ORR) in alkaline electrolyte than those of commercial Pt/C (50 *wt*%, 0.96 V) and home-made Pt nanoparticles (NPs)/rGO (Pt NPs/rGO, 0.97 V), showing the enhanced catalytic performance for hydrogen evolution reaction (HER) with the positive onset potential (–26 mV) and a small Tafel slope (31 mV dec^{-1}) relative to Pt/C (–18 mV, 31 mV dec^{-1}) and Pt NPs/rGO (–42 mV, 36 mV dec^{-1}) in 0.5 M H_2SO_4.

Keywords: Porous alloy nanoflowers; Ionic liquid; Reduced graphene oxide;