Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Spin-dependent Deprotonation Induced Giant Magnetocurrent in Electrochemical Cells

Haiping Pan[a], Yan Shen[a], Jiashun Duan[a], Kai Lu[a] and Bin Hu[a,b] *

[a]*Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information, Huazhong University of Science and Technology, Wuhan 430074, China*

[b]*Department of Materials Science and Engineering, University of Tennessee, Knoxville, TN 37996, USA*

Supplementary information to exclude Lorentz force and magneto-convection effects. When the applied electrode potentials are less than 0.6V in acetonitrile, there are current generated by supporting electrolyte-ions migration in the electrochemical cell but no magneto-current is observed (shown in Fig.S1, S2 and S3). According to cyclic voltammograms of tertiary amines, when the electrode potentials are less than 0.6V in acetonitrile, the oxidation of amines hardly occurs but there are ion migration and diffusion in the electrochemical cells. This result can exclude the Lorentz force and magneto-convection effects in our system because these effects are only related to ion migration and diffusion. However, when applied electrode potential is much higher, e.g. 2V, the oxidation of amine sufficiently occurs and significant MC is observed (Fig. S1c, S2c and S3c). Thus the magneto-current with different applied electrode potentials further confirms that the magneto-current is generated by the oxidation of tertiary amines and Lorentz force and magneto-convection effect can be excluded.

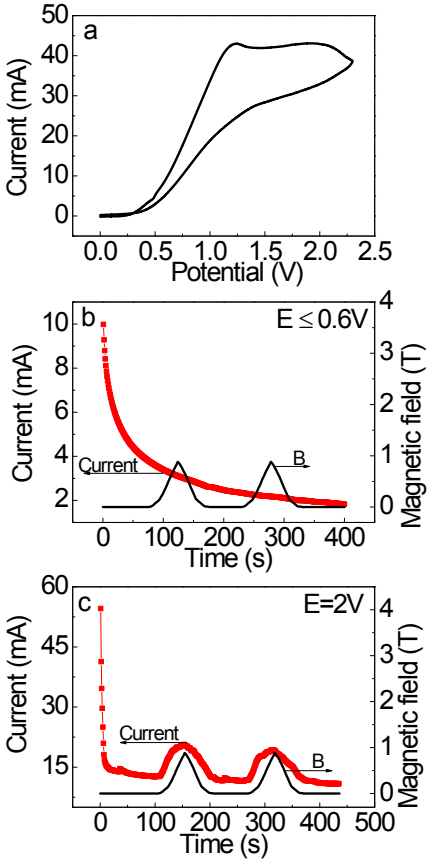

Fig. S1 Cyclic voltammogram (a); the current-time characteristics before, during and after the application of a magnetic field at 0.6V (b) and 2V (c). The solution contains 0.1M TEA and 0.1M TBAP dissolved in acetonitrile.

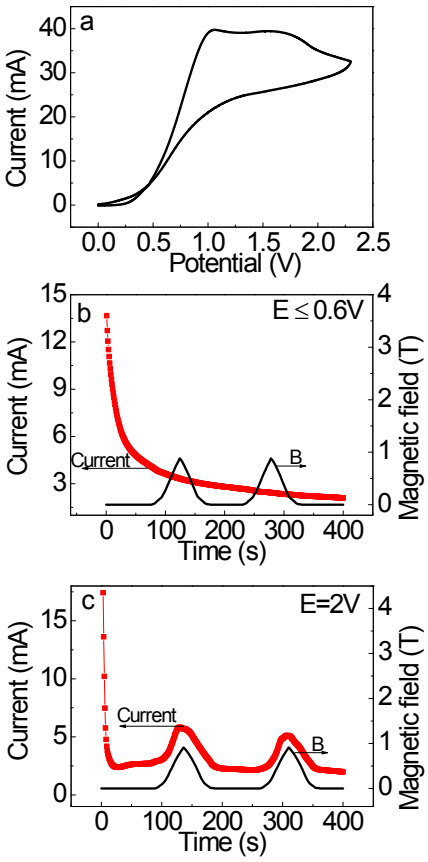

Fig. S2 Cyclic voltammogram (a); the current-time characteristics before, during and after the application of a magnetic field at 0.6V (b) and 2V (c). The solution contains 0.1M TPA and 0.1M TBAP dissolved in acetonitrile.

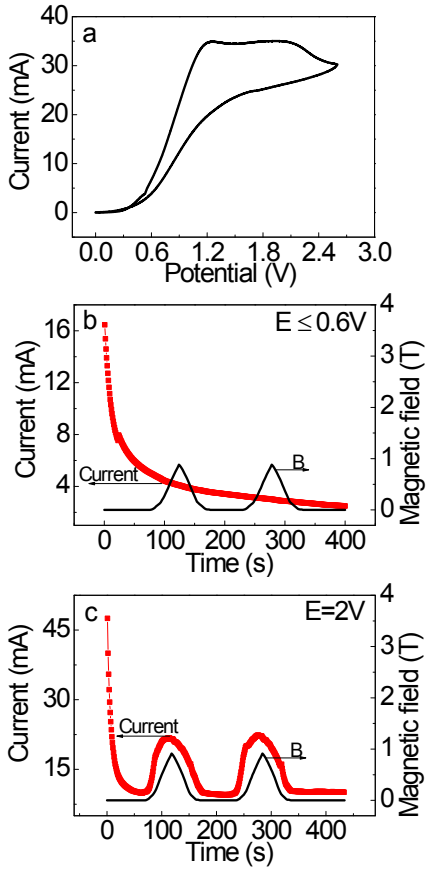

Fig. S3 Cyclic voltammogram (a); the current-time characteristics before, during and after the application of a magnetic field at 0.6V (b) and 2V (c). The solution contains 0.1M TBA and 0.1M TBAP dissolved in acetonitrile.