

**Supporting Information for**  
**“The Oxidation of Several *p*-Phenylenediamines in Room Temperature**  
**Ionic Liquids: Estimation of Transport and Electrode Kinetic Parameters .”**

Jenny S. Long<sup>[a]</sup>, Debbie S. Silvester<sup>[a]</sup>, Alexander S. Barnes<sup>[a]</sup>, Neil V. Rees<sup>[a]</sup>, Leigh  
Aldous,<sup>[b]</sup> Christopher Hardacre<sup>[b]</sup> and Richard G. Compton.<sup>\*[a]</sup>

[a] *Physical and Theoretical Chemistry Laboratory, Oxford University,*  
*South Parks Road, Oxford OX1 3QZ, United Kingdom.*

[b] *School of Chemistry and Chemical Engineering/QUILL,*  
*Queen’s University Belfast,*  
*Belfast, Northern Ireland BT9 5AG, United Kingdom.*

***To be submitted: J. Phys. Chem. C***

---

\* To whom correspondence should be addressed.

Email: richard.compton@chem.ox.ac.uk

Direct Tel: 01865 275413: Fax : 01865 275410

### Figure Legends:

Figure 1: Comparison of the experimental (-) and simulated (o) cyclic voltammograms for the oxidation of TMPD in a range of ionic liquids at 303 K on a platinum microelectrode, (diameter 10  $\mu\text{m}$ ) at a range of scan rates, using values of  $D$  and  $c$  obtained from chronoamperometric data. a) 4.74 mM TMPD in  $[\text{C}_2\text{mim}][\text{NTf}_2]$ , b) 6 mM TMPD in  $[\text{C}_4\text{mim}][\text{NTf}_2]$ , c) 6.30 mM TMPD in  $[\text{C}_4\text{mpyrr}][\text{NTf}_2]$ , d) 25 mM TMPD in  $[\text{C}_4\text{mim}][\text{PF}_6]$  and e) 6.05 mM TMPD in  $[\text{C}_4\text{mim}][\text{BF}_4]$ .

Figure 1a):

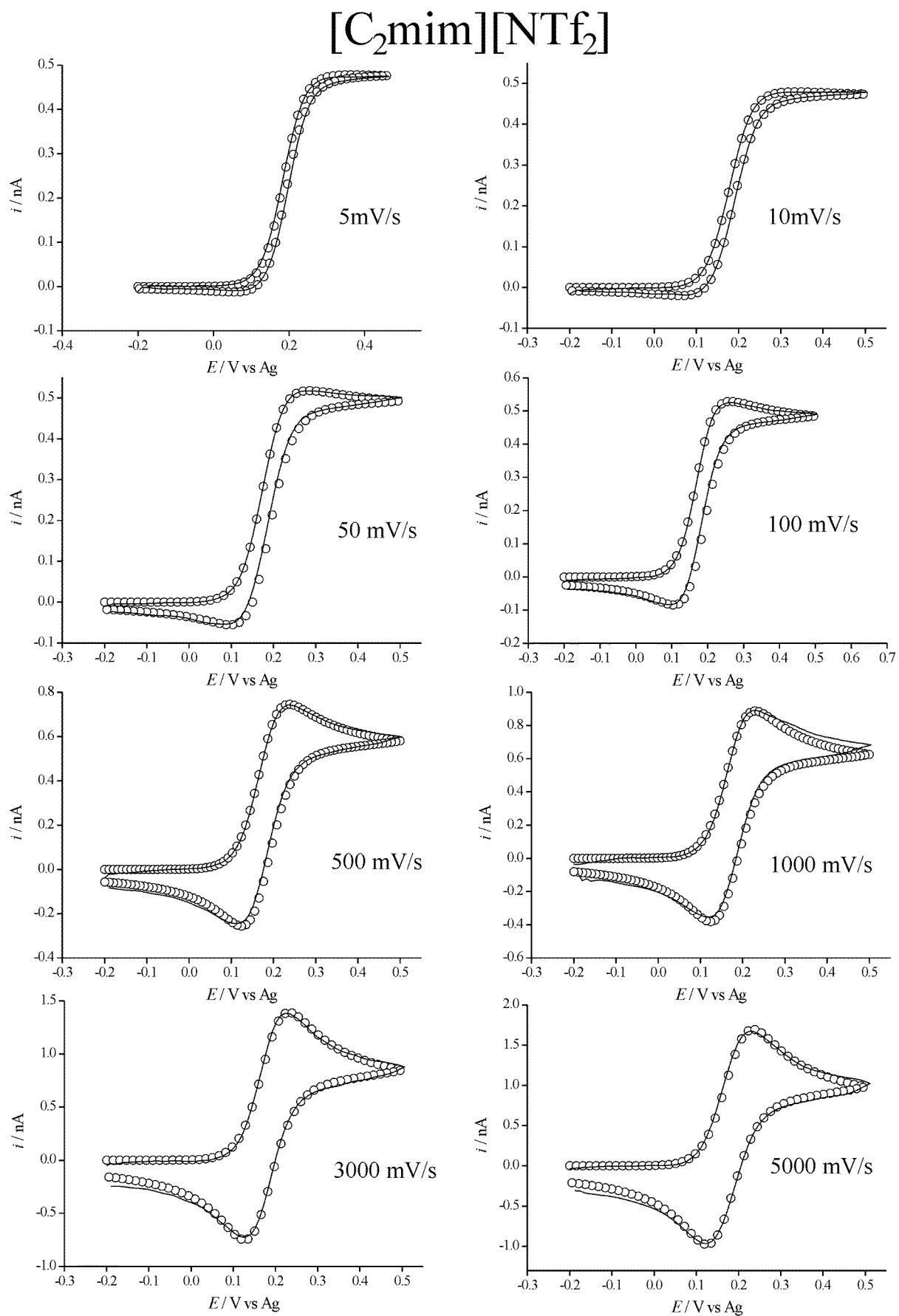


Figure 1b):

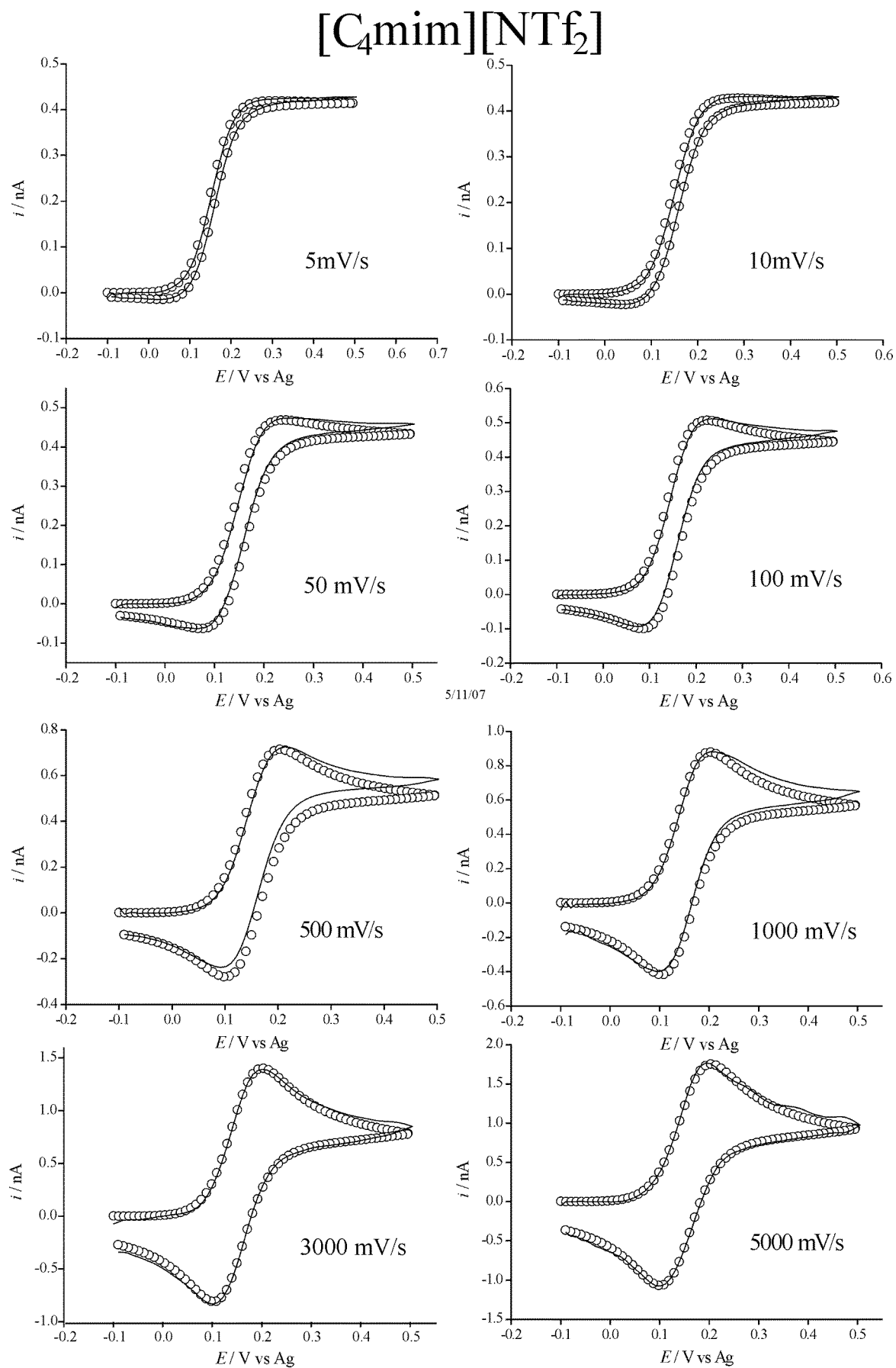


Figure 1c):

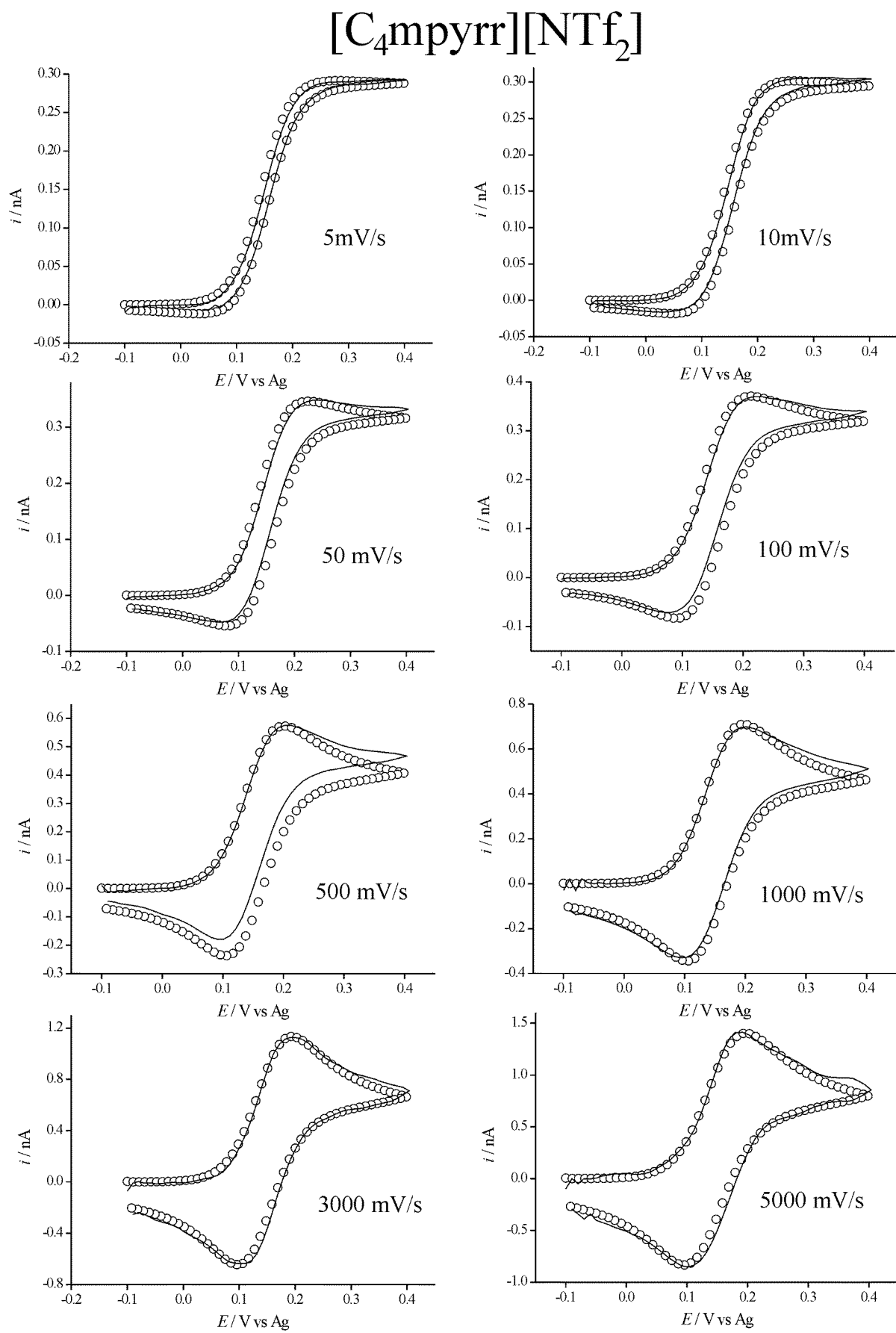


Figure 1d):

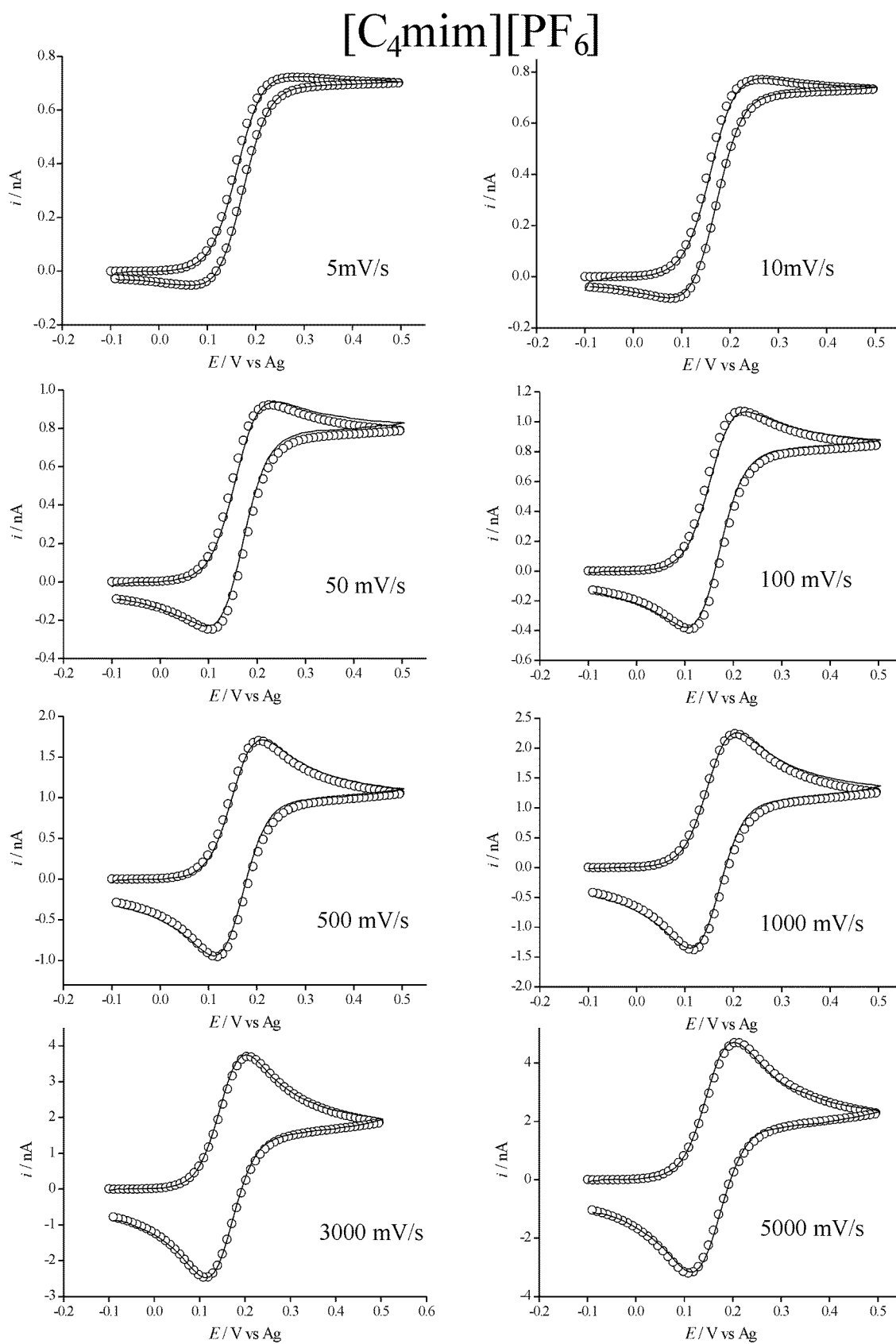
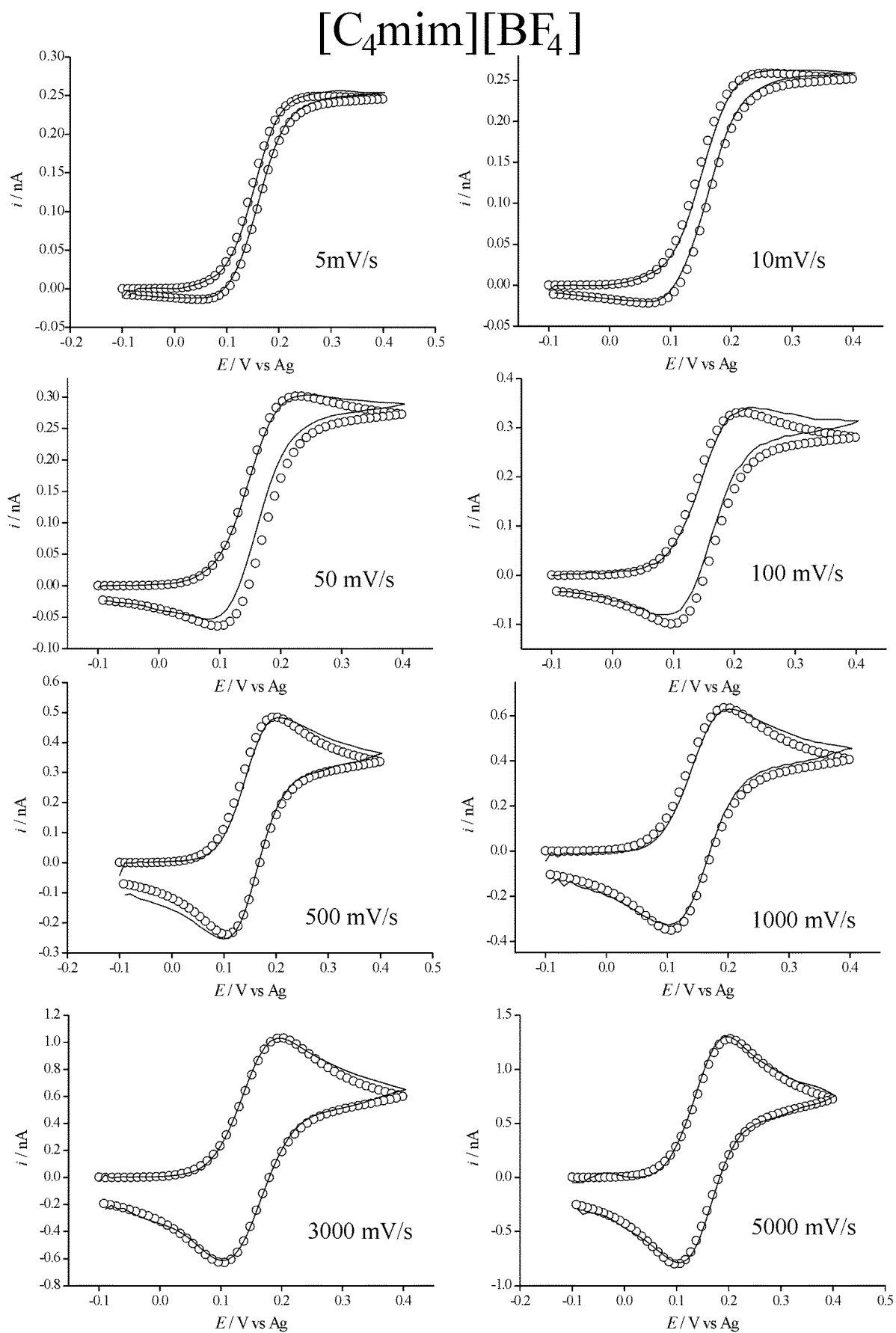


Figure 1e):



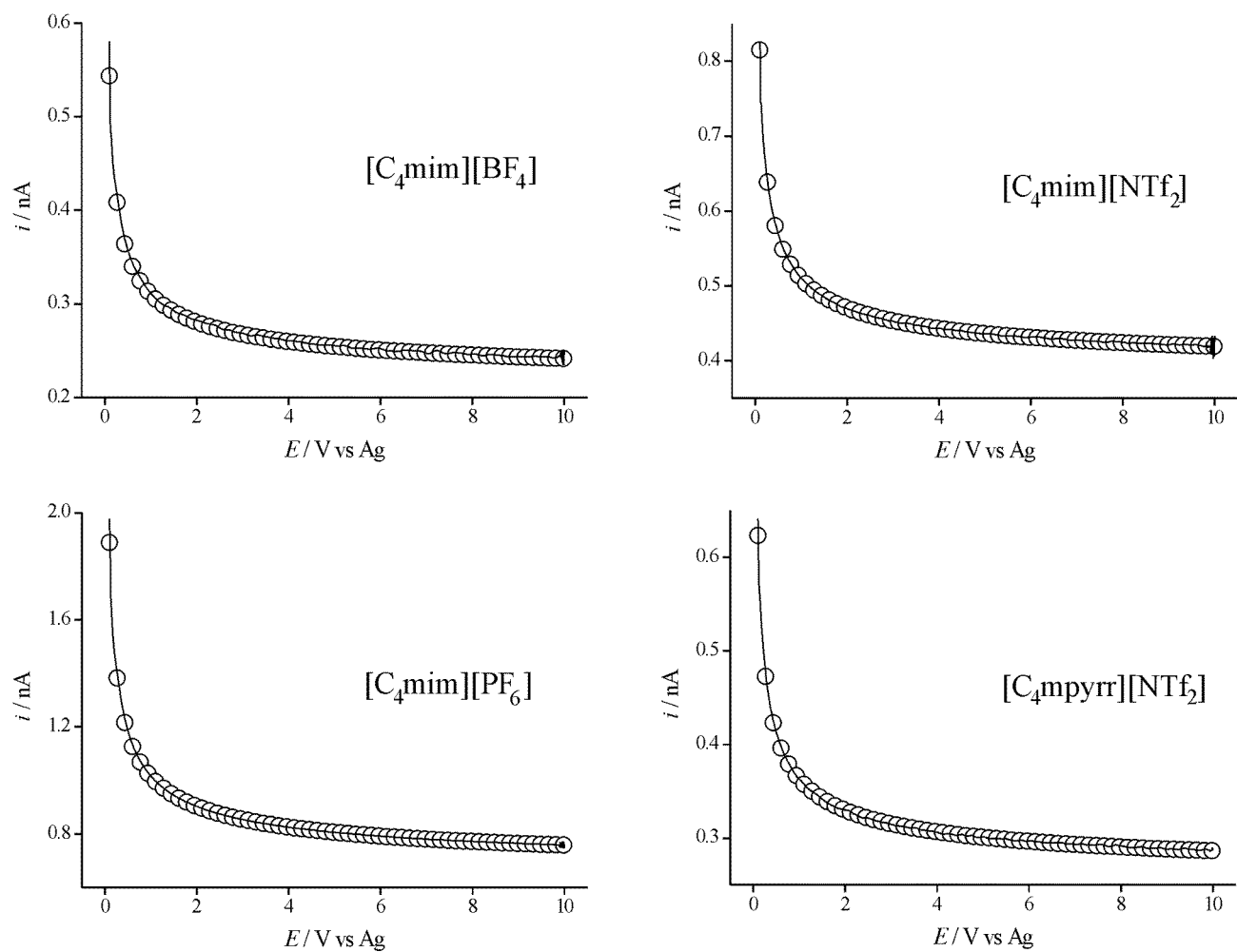


Figure 2: Experimental (-) and fitted theoretical (o) chronoamperometric transients recorded for the oxidation of TMPD in several different ionic liquids. The potential was stepped from -0.2V to +0.4V.



# TMPD in $[C_4mim][PF_6]$

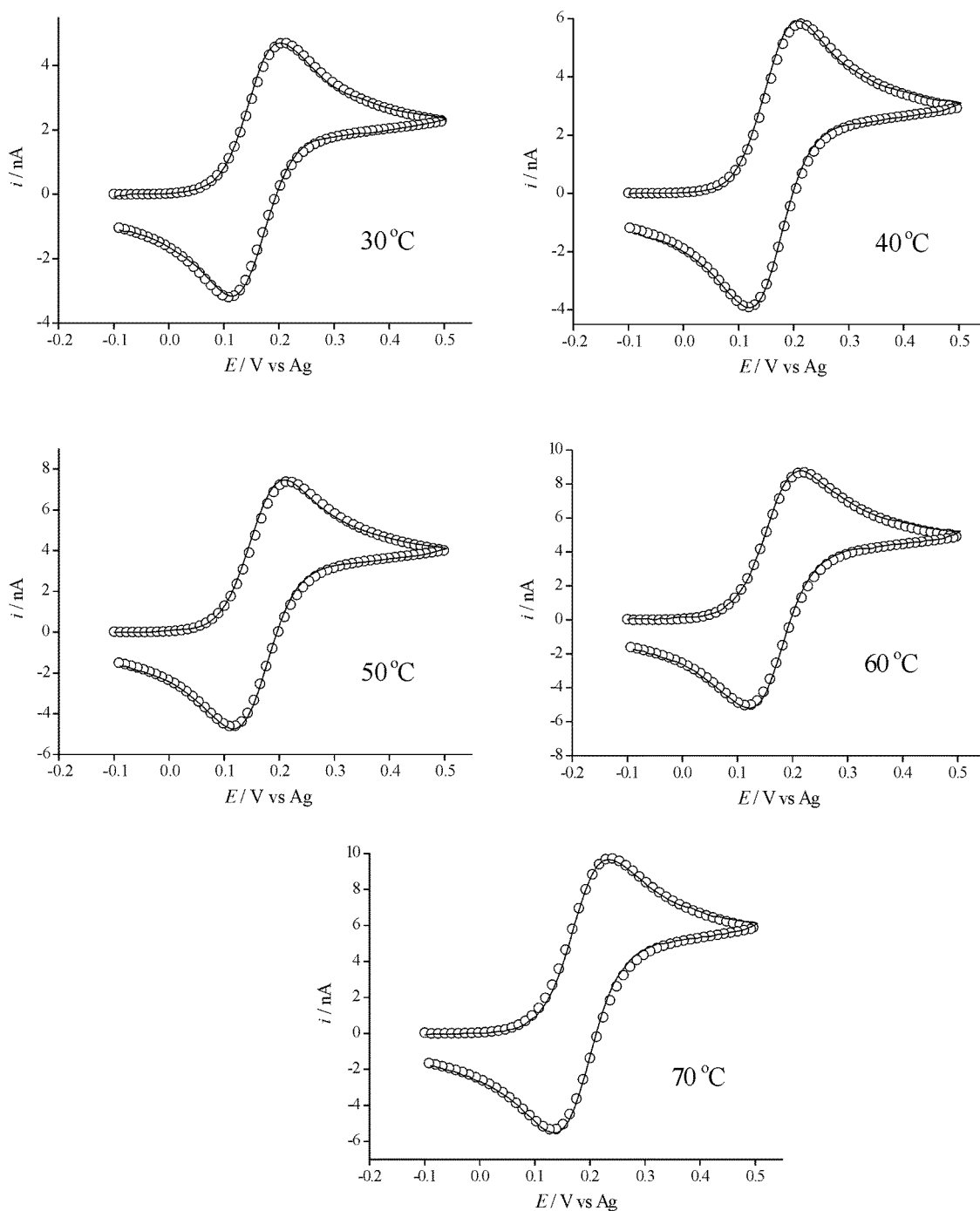


Figure 3: Comparison of the experimental (-) and simulated (o) cyclic voltammograms for the oxidation of 25.0 mM TMPD in  $[C_4mim][PF_6]$  at a range of temperatures on a platinum microelectrode (diameter 10  $\mu m$ ) at 5 V s<sup>-1</sup>, using values of  $D$  and  $c$  obtained from chronoamperometric data.

Figure 4: Comparison of the experimental (-) and simulated (o) cyclic voltammograms for the oxidation seven different *p*-phenylenediamines at 303 K on a platinum microelectrode (diameter 10  $\mu\text{m}$ ) at a range of scan rates, using values of  $D$  and  $c$  obtained from chronoamperometric data. a) 19.9 mM 2,3,5,6 TMPD, b) 4.3 mM DMPD, c) 8.78 mM PPD, d) 19.81 mM DPPD, e) 13.00 mM DEDHPD and f) 16.40 mM DEDBPD.

Figure 4a):

## 2,3,5,6 TMPD in $[\text{C}_2\text{mim}][\text{NTf}_2]$

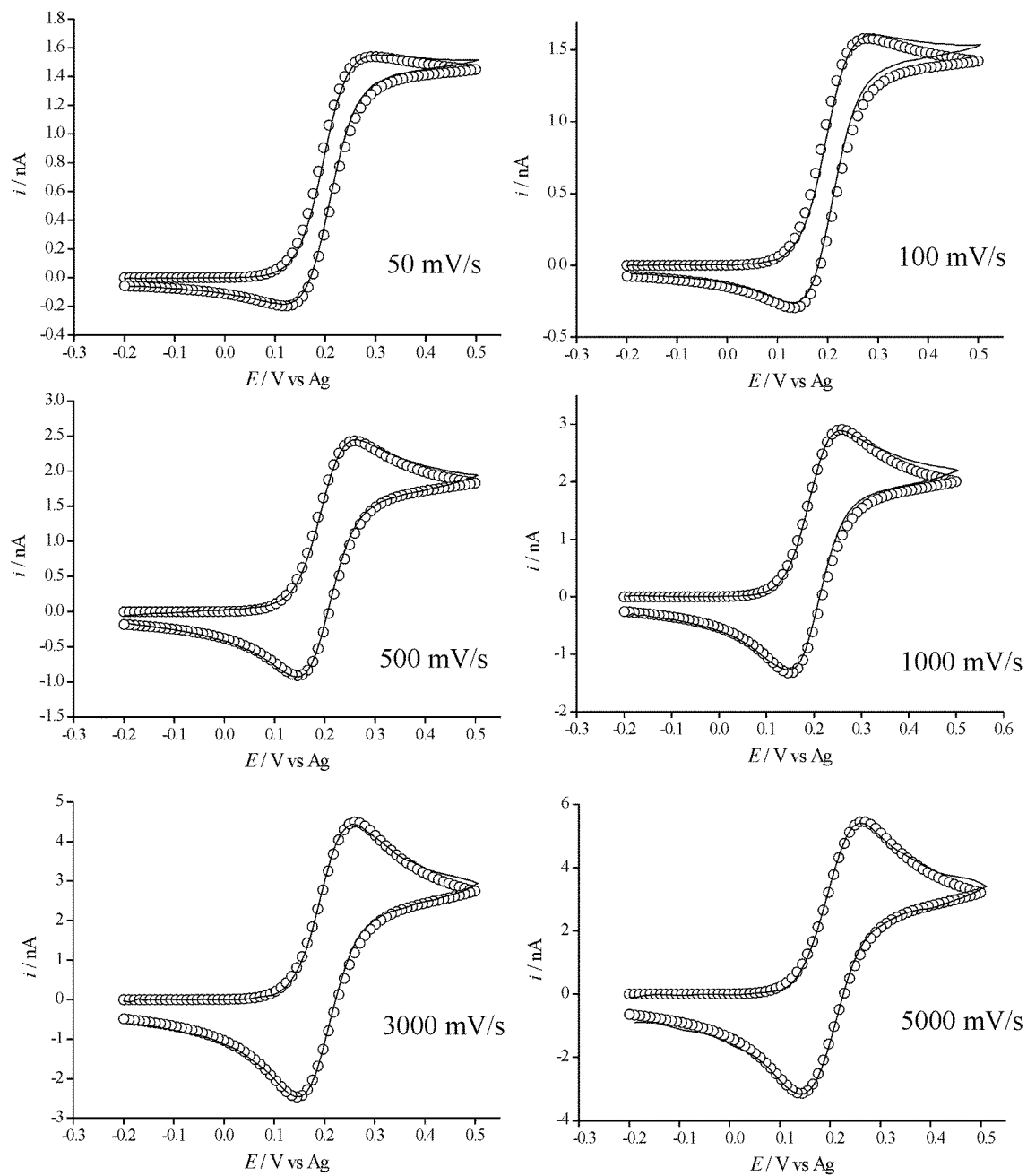


Figure 4b):

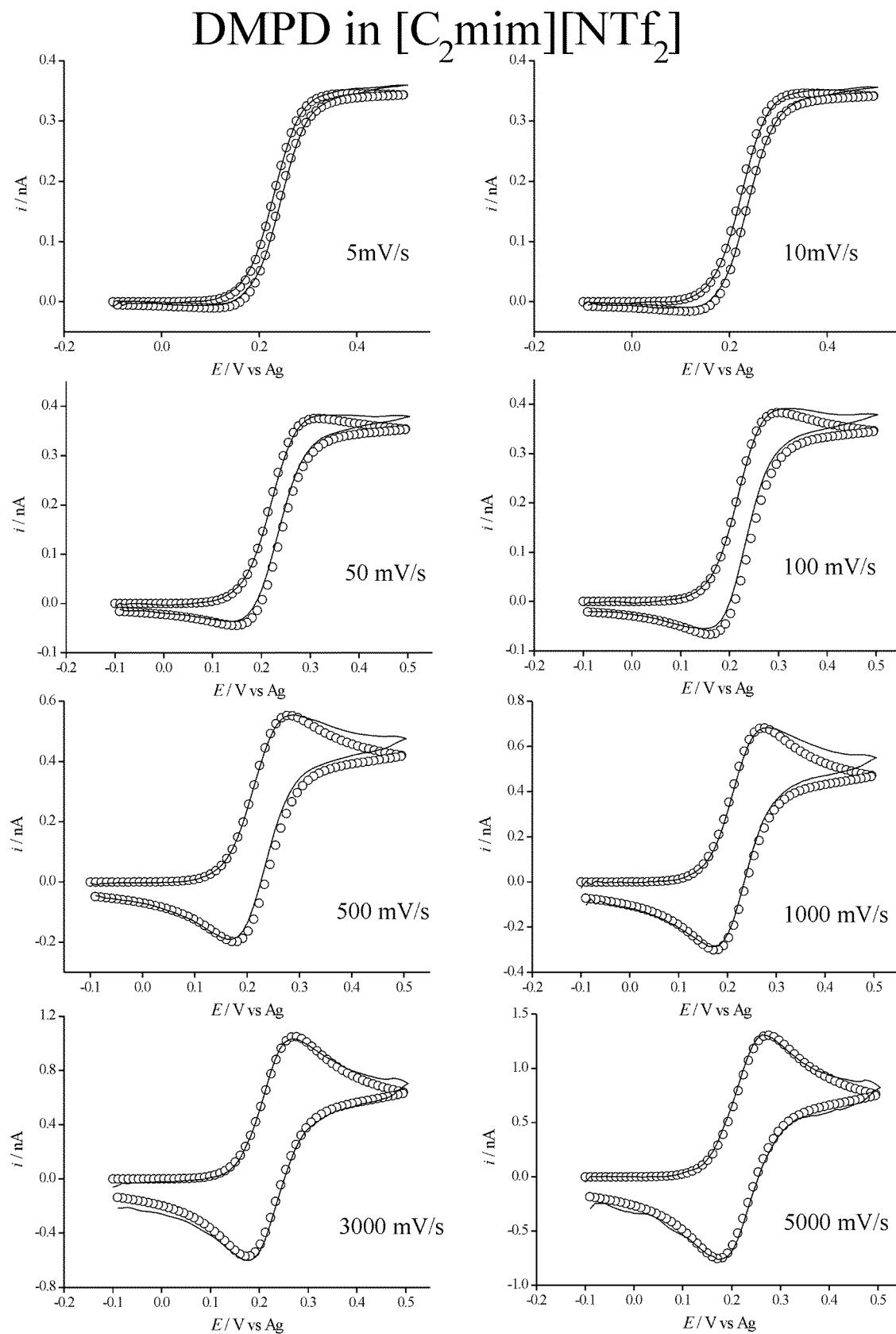


Figure 4c):

## PPD in $[\text{C}_2\text{mim}][\text{NTf}_2]$

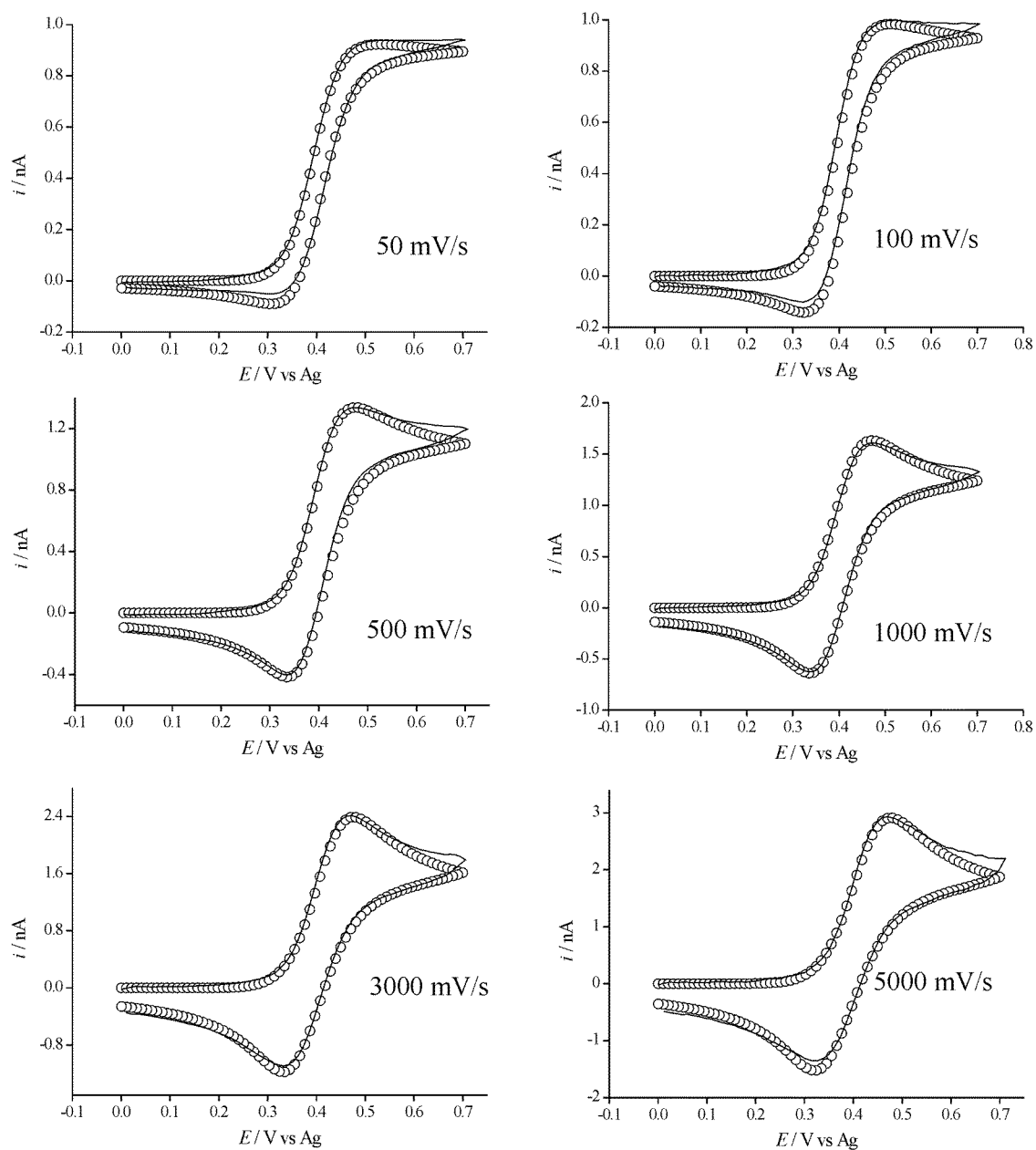


Figure 4d):

## DPPD in $[\text{C}_2\text{mim}][\text{NTf}_2]$

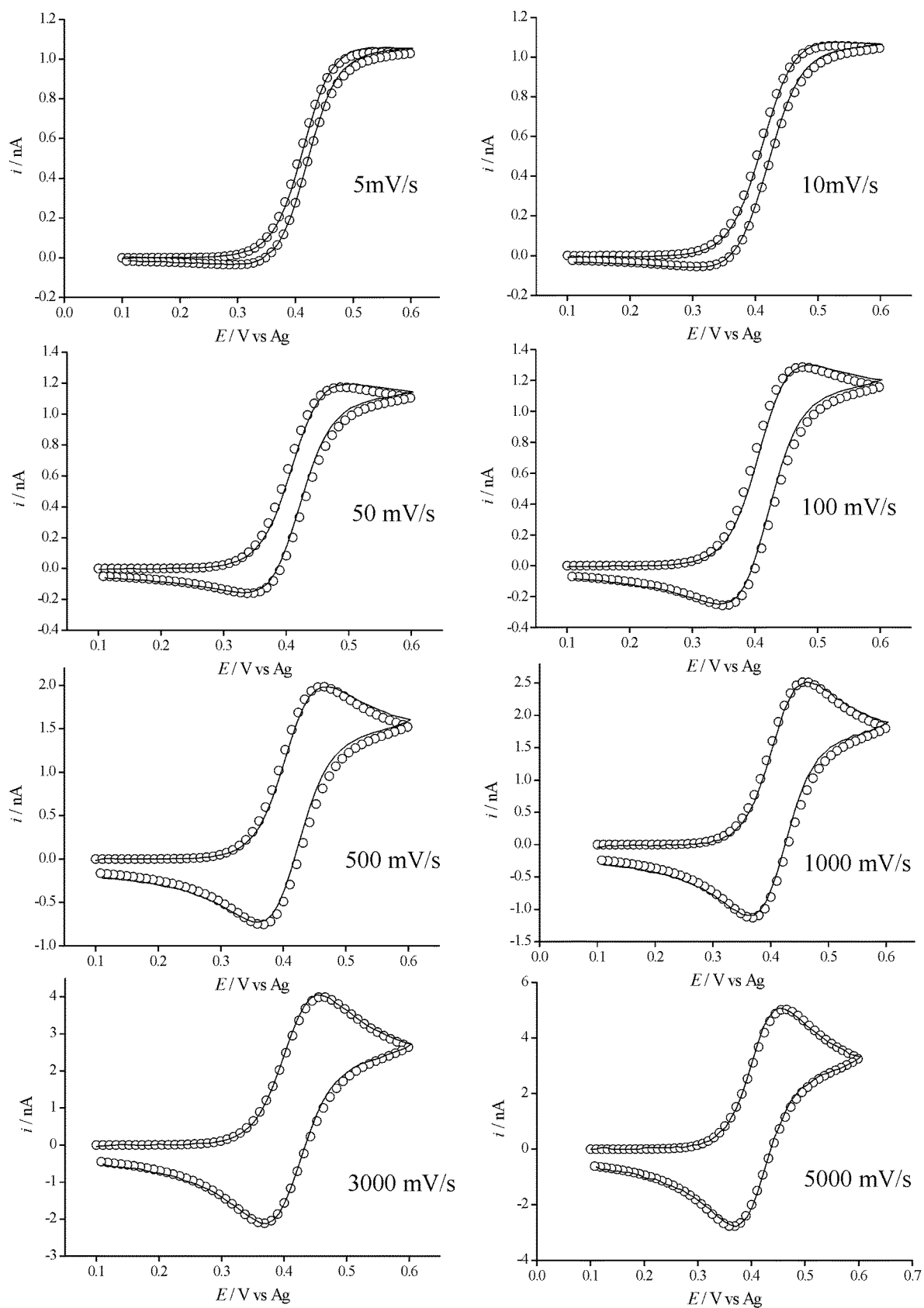


Figure 4e):

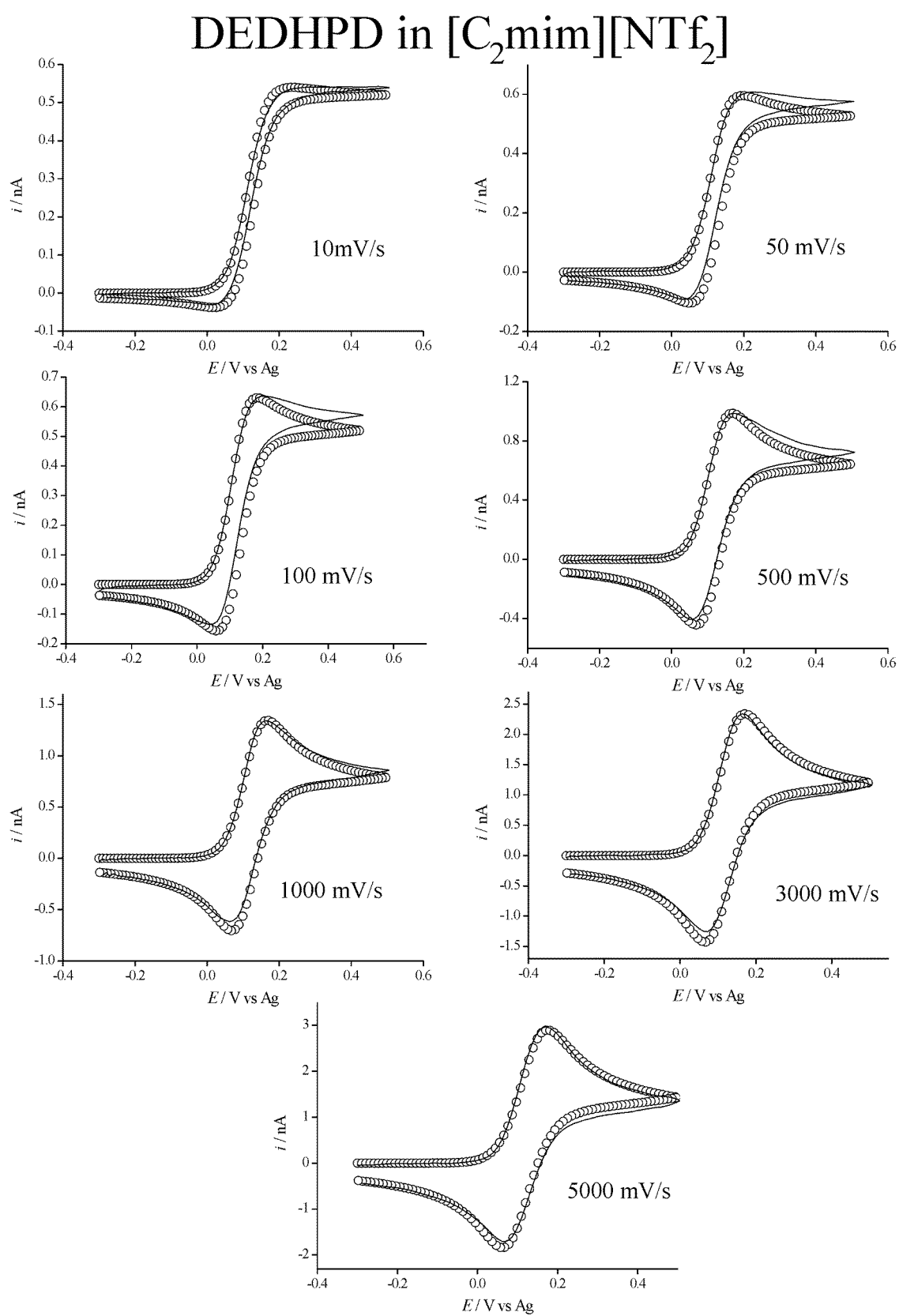


Figure 4f):

# DEDBPD in $[C_2mim][NTf_2]$

