Supplementary Information

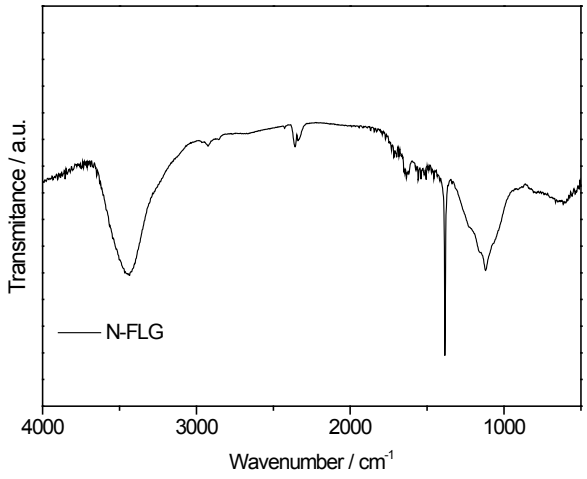

Figure S1. Infrared spectrum in the range 4000–500 cm^{-1} for N-FLG.

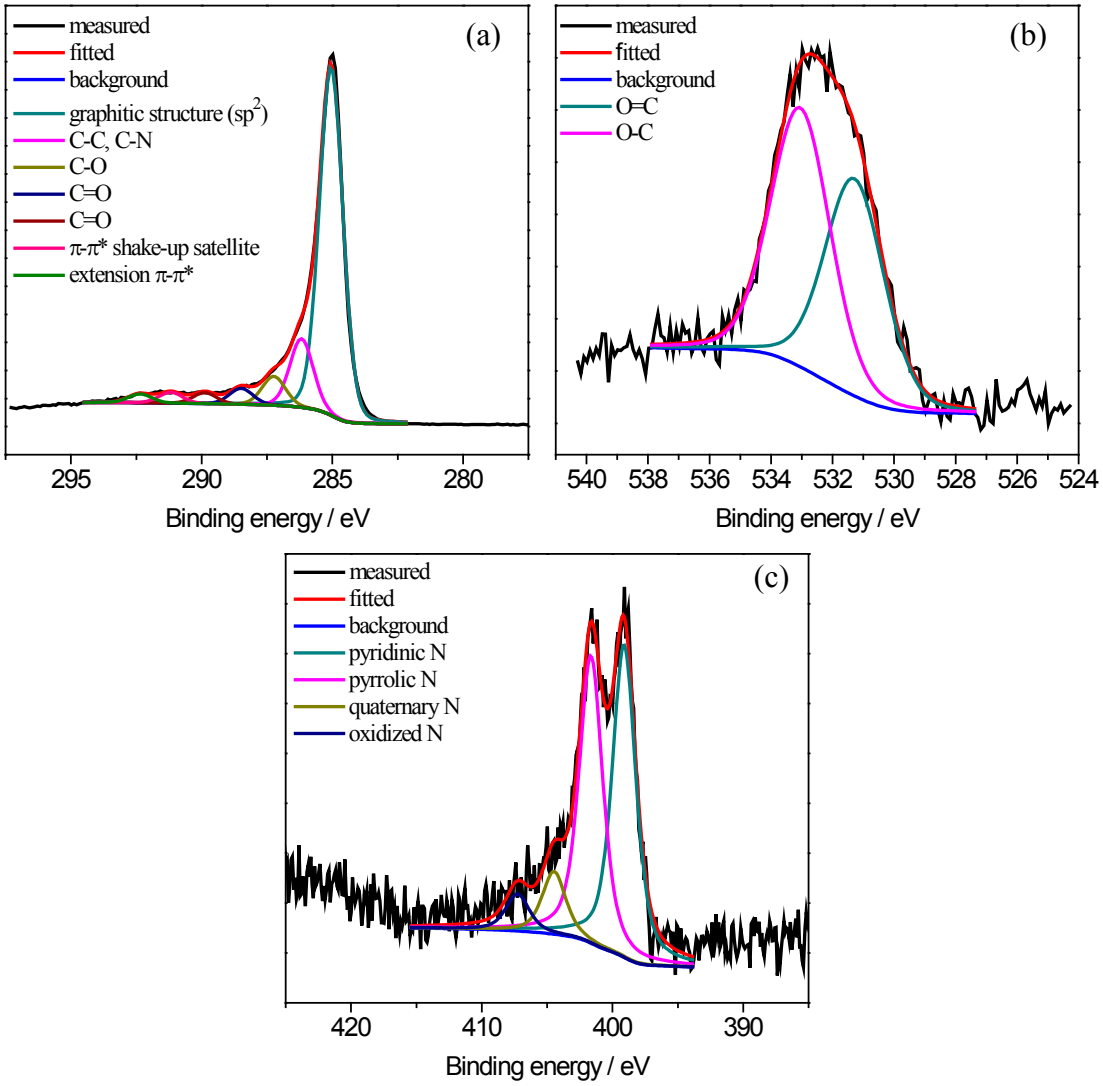

Figure S2. Deconvoluted C 1s (**a**), O 1s (**b**) and N 1s (**c**) XPS spectra of N-FLG.

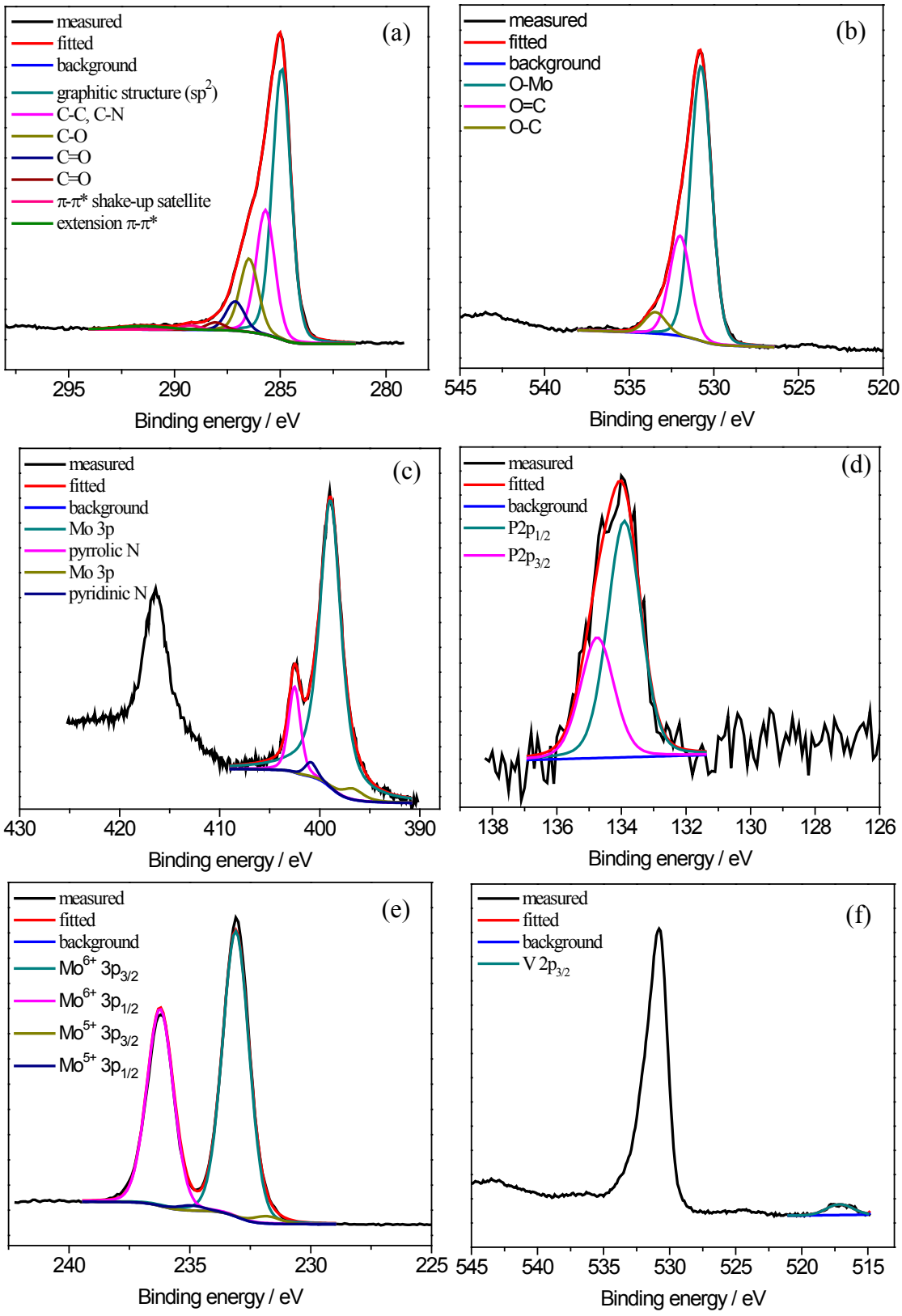

Figure S3. Deconvoluted C 1s (**a**), O 1s (**b**), N 1s (**c**), P 2p (**d**), Mo 3d (**e**) and V 2p (**f**) XPS spectra of $PMo_{11}V$@N-FLG.

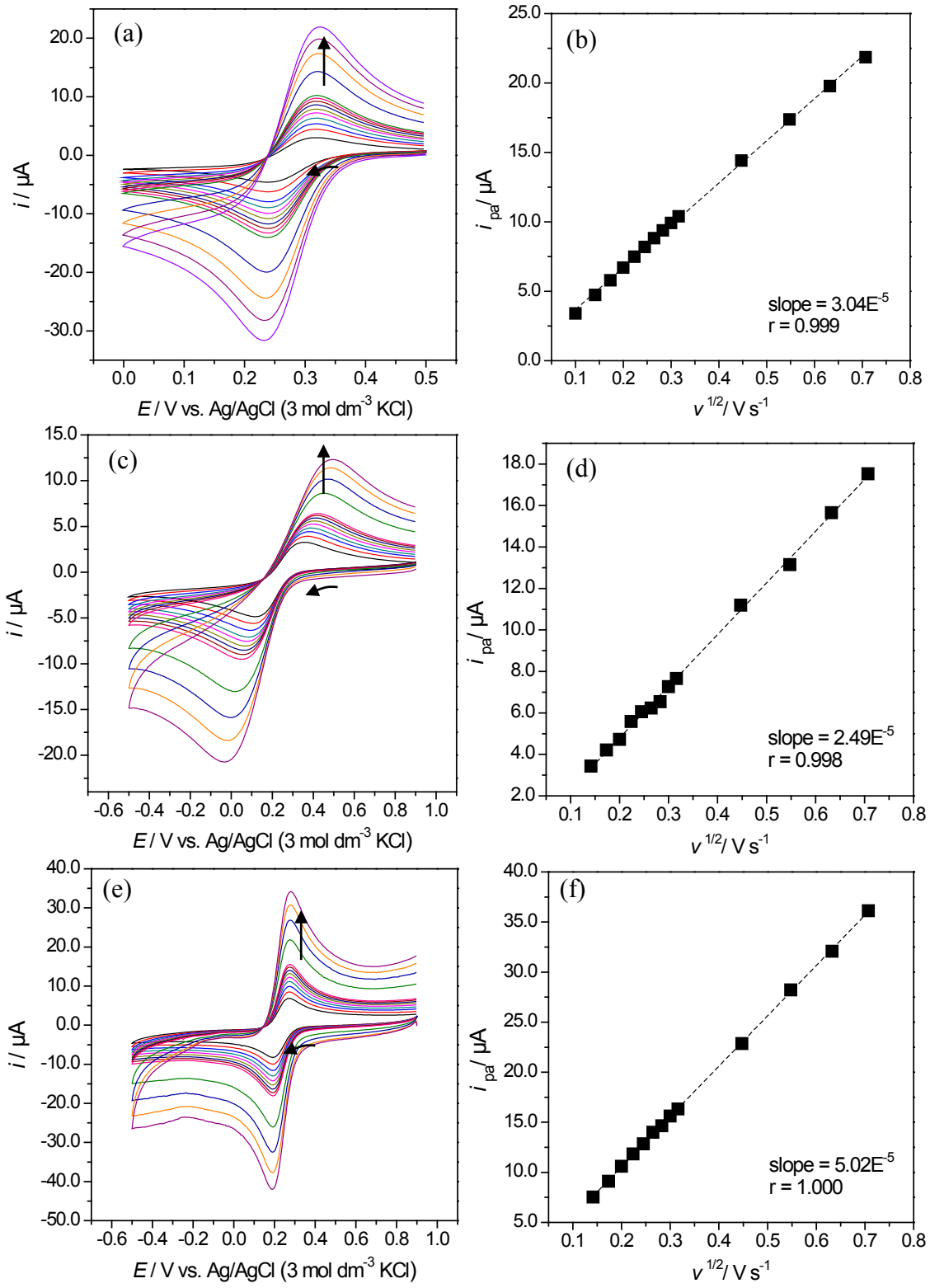

Figure S4. Cyclic voltammograms of $[Fe(CN)_6]^{3-}$ (1×10^{-3} mol dm^{-3}, 1 mol dm^{-3} KCl) at bare GCE (**a**), N-FLG/GCE (**c**) and $PMo_{11}V$@N-FLG/GCE (**e**) and respective plots of i_{pa} *vs.* $v^{1/2}$ (**b**, **d** and **f**).

Table S1. Core-level binding energies of each component for N-FLG and $PMo_{11}V$@N-FLG obtained by curve fitting of XPS spectra.

Sample	Binding Energy (BE)					
	C 1s	**O 1s**	**N 1s**	**P $2p_{3/2}$ + $3p_{1/2}$**	**V $2p^{3/2}$**	**Mo $3d_{3/2}$ + $3d_{5/2}$ (Mo^{6+}/Mo^{5+})**
N-FLG	285.0 (1.05), 286.2 (1.05), 287.2 (1.05), 288.5 (1.05), 289.9 (1.05), 291.2 (1.05), 292.4 (2.34)	531.3 (2.28), 533.0 (2.28)	399.1 (2.14), 401.6 (2.14), 404.5 (2.14), 407.3 (2.14)			
$PMo_{11}V$@N-FLG	284.9 (1.03), 285.7 (1.03), 286.5 (1.03) 287.1 (1.03), 288.1 (1.03), 289.2 (1.03), 291.5 (2.75)	530.8 (1.46), 532.0 (1.46), 533.5 (1.46)	400.9 (1.41), 402.5 (1.41)	133.9 (1.23), 134.7 (1.23)	517.1 (2.36)	233.1 (1.29), 236.2 (1.29), 231.8 (1.29), 234.9 (1.19)

The values between brackets refer to the FWHM of the bands.