Supporting Information

Table 1S. Soret band absorption maximum of enzymes in DMPC films and in solution at various pHs.

	KatG (nm)	Catalase (nm)	HRP (nm)	CcP (nm)	SP (nm)
Enzyme-DMPC film[a]	409	409	403	410	405
Films dissolved in pH 7.0 buffer[b]	407	406	403	410	403
pH[c]	Enzymes in buffer solution:				
7.1	408	407	403	409	404
8.0	408	407	403	411	404
9.0	408	410	403	412	405
10.0	407	410	404	410	413
11	408	411	411	392[c]	415
7[d]		407	403	410	404
6.0	408	407	403	409	404
5.1	408	405[e]	403	410	404
4.0	409[e]	404[e]	405	411	406
3.0	380[c]	379[c]	377[c]	379[c]	407
7[d]	408	ND[f]	402	408	404

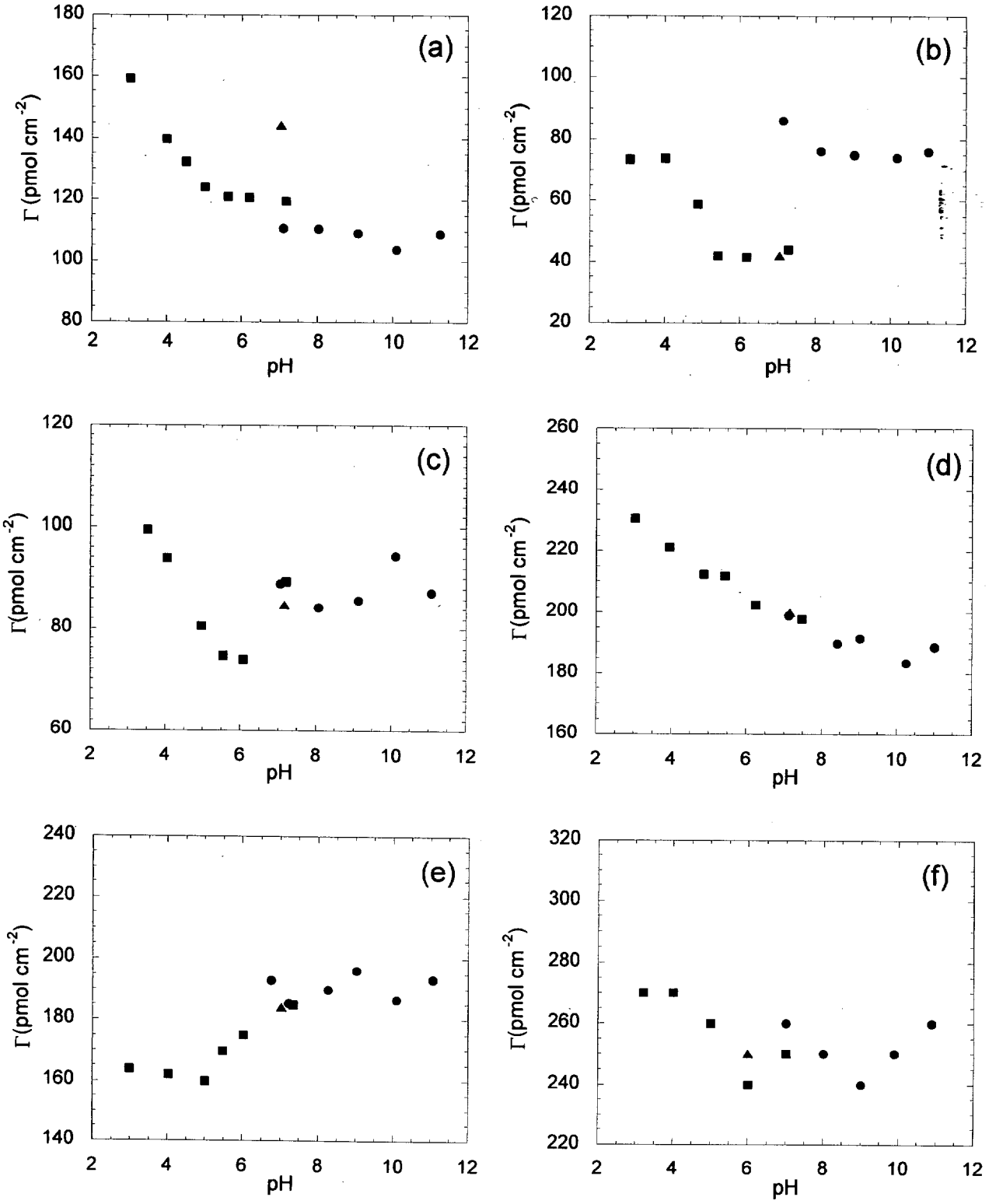
[a] on quartz. [b] Samples were prepared by dissolving enzyme-DMPC films into 20 mM phosphate buffer at pH 7. [c] Absorption peak was much broader than that at pH 7. [d] pH was adjusted from 11to 7 or from 3 to 7. [e] Enzyme solution became cloudy and absorbance decreased with time. [f] After pH adjusted from 3.0 to 7, solution became cloudy and no absorption peak was detected.

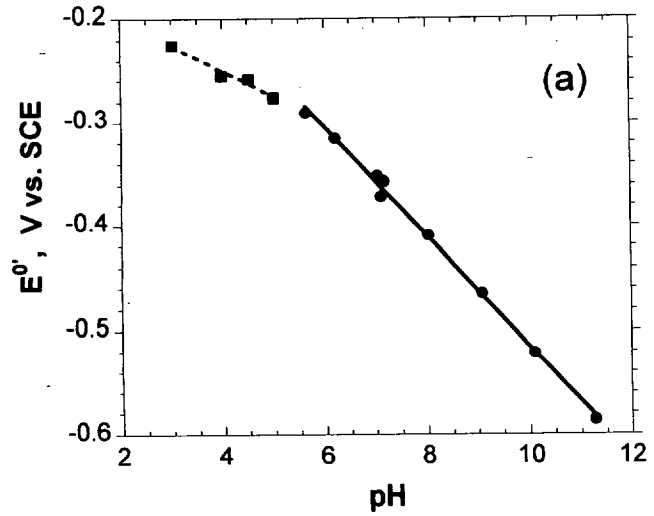
Figure Captions

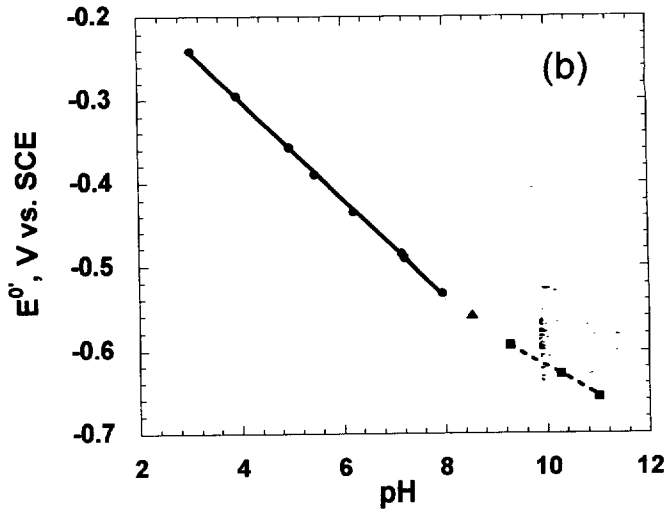
FIG. 1S. Influence of pH changes on surface concentration (Γ) of electroactive enzymes in DMPC films obtained from avg. integration of reduction peaks of CVs at low scan rates. (a) KatG, (b) Cat, (c) HRP, (d) CcP, (e) SP, (f) Mb. pH was adjusted with diluted NaOH and HCl from neutral (•) to high pH, then to neutral (■), then to low pH, and finally back to neutral pH (▲).

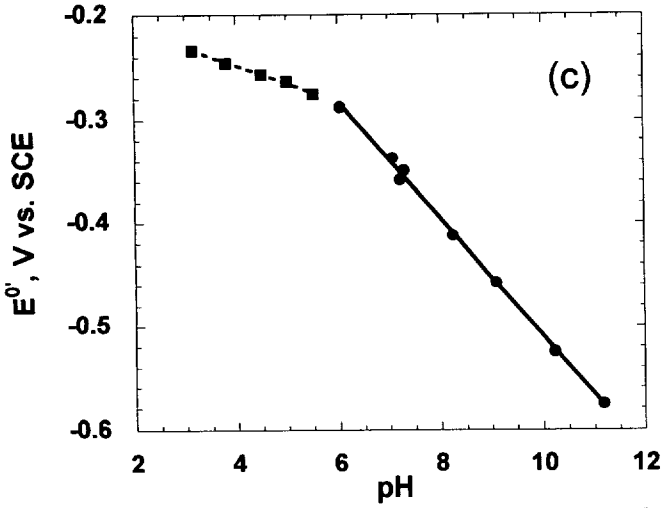
FIG. 2S. Influence of pH on formal potentials for DMPC films of (a) KatG, (b) Cat, (c) HRP, (d) CcP, (e) SP, (f) Mb. Formal potentials were estimated from midpoint potentials of reduction-oxidation peaks in CVs.

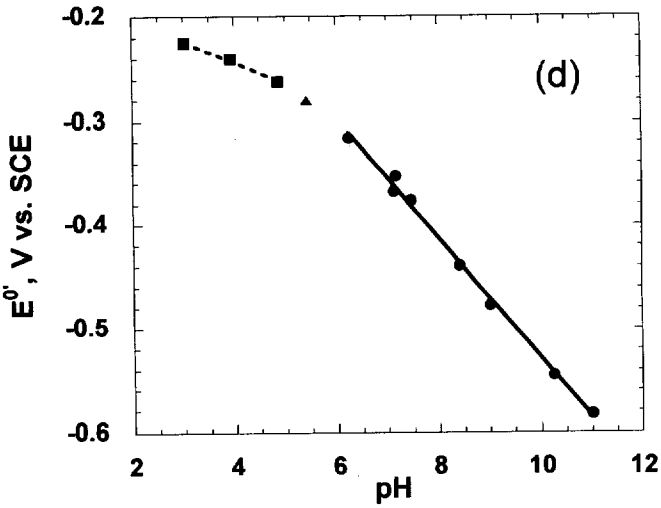
FIG. 3S. Absorption spectra of catalase-peroxidase in solution and in DMPC films at different pH values.

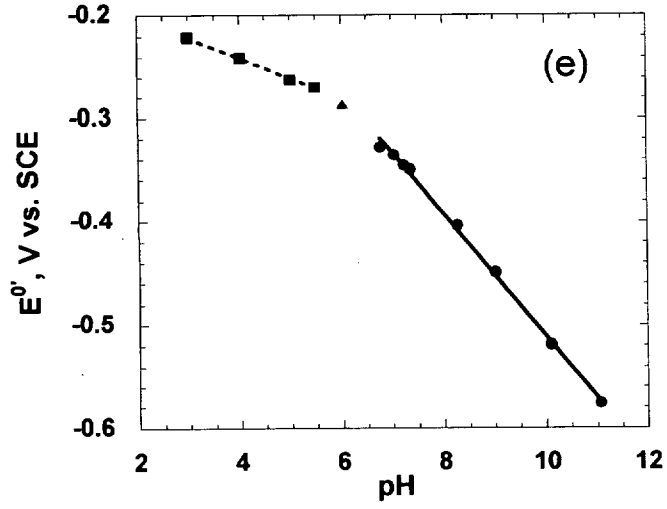

(a)
(b)
(c)
(d)
(e)
(f)
Γ (pmol cm-2)
pH

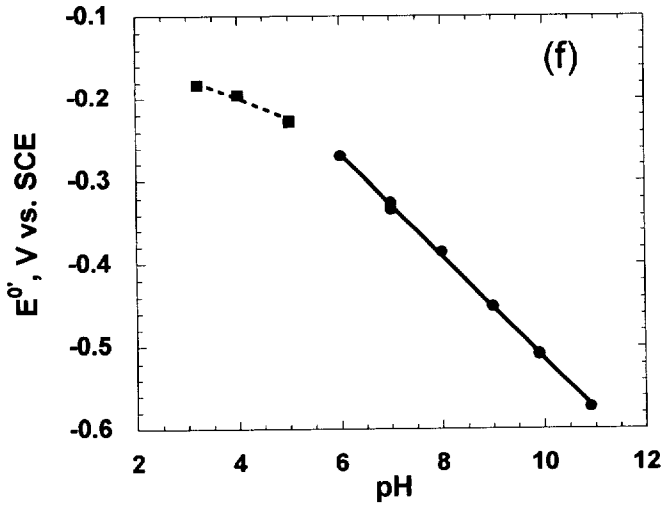

(a)
E$^{0'}$, V vs. SCE
pH
-0.2
-0.3
-0.4
-0.5
-0.6
2
4
6
8
10
12


(b)
E$^{0'}$, V vs. SCE
pH
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
2
4
6
8
10
12


(c)
E$^{0'}$, V vs. SCE
pH
-0.2
-0.3
-0.4
-0.5
-0.6
2
4
6
8
10
12


(d)
E$^{0'}$, V vs. SCE
pH
-0.2
-0.3
-0.4
-0.5
-0.6
2
4
6
8
10
12


(e)
E$^{0'}$, V vs. SCE
pH
-0.2
-0.3
-0.4
-0.5
-0.6
2
4
6
8
10
12


(f)
E$^{0'}$, V vs. SCE
pH
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
2
4
6
8
10
12

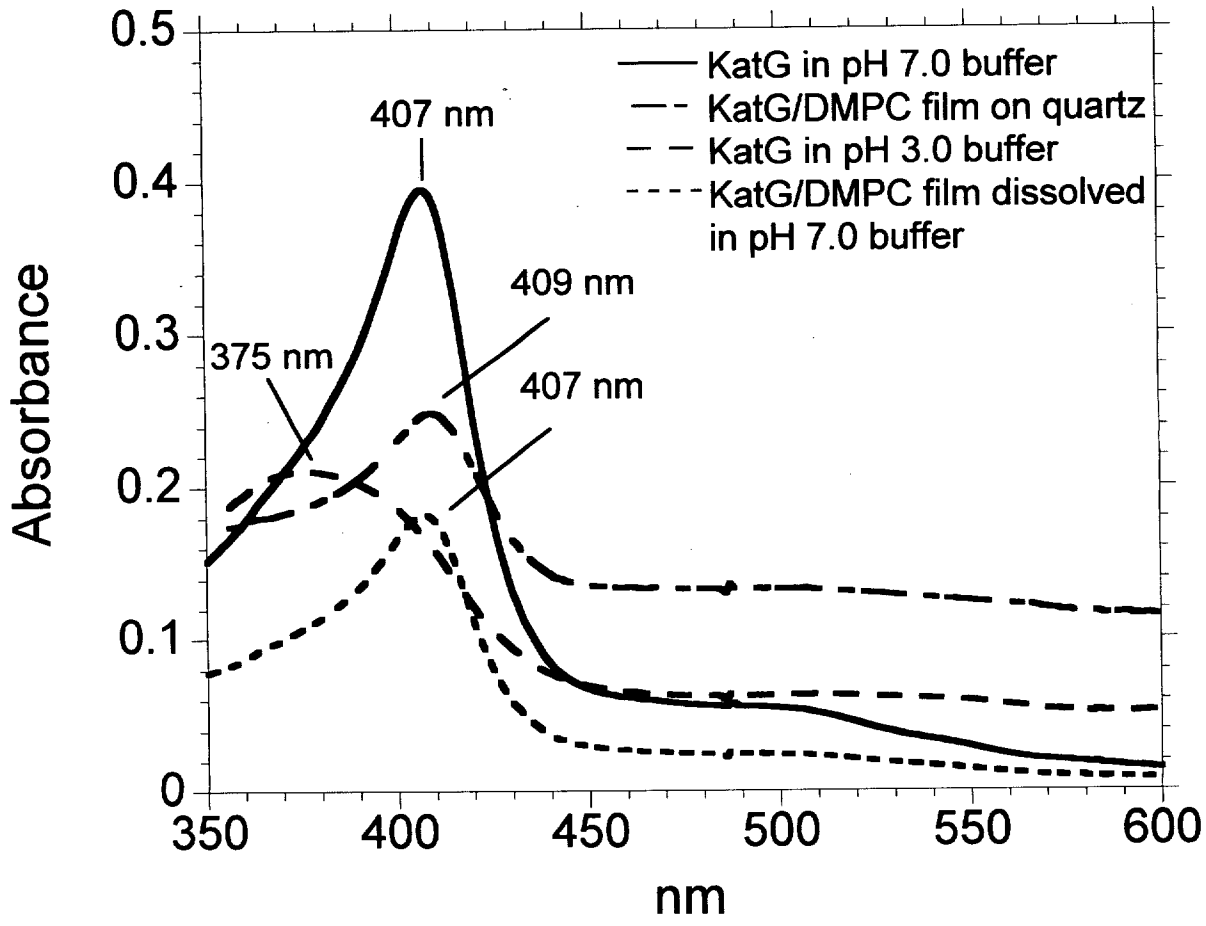

KatG in pH 7.0 buffer
KatG/DMPC film on quartz
KatG in pH 3.0 buffer
KatG/DMPC film dissolved in pH 7.0 buffer
407 nm
409 nm
375 nm
407 nm
Absorbance
0.5
0.4
0.3
0.2
0.1
0
350
400
450
500
550
600
nm

Fig S3