

# Supporting Information

## Ternary Pt-Fe-Co Alloy Electrocatalysts Prepared by Electrodeposition: Elucidating the Roles of Fe and Co in Oxygen Reduction Reaction

Seung Jun Hwang<sup>1</sup>, Sung Jong Yoo<sup>1</sup>, Soohwan Jang<sup>2</sup>, Tae-Hoon Lim<sup>1</sup>, Seong Ahn Hong<sup>1</sup> and Soo-Kil Kim<sup>1\*</sup>

<sup>1</sup>Fuel Cell Center, Korea Institute of Science and Technology (KIST), Seoul, 136-791, Republic of Korea

<sup>2</sup>Department of Chemical Engineering, Dankook University, Yongin, 448-701, Republic of Korea

\*E-mail: sookilkim@kist.re.kr

**Figure S1: XRD data**

S2

**Figure S2: EPMA data**

S3~S5

**Figure S3: SEM images**

S6

**Figure S4: CV data**

S7

**Figure S5: Half wave potential data**

S8

**Figure S6: EXAFS fitting data**

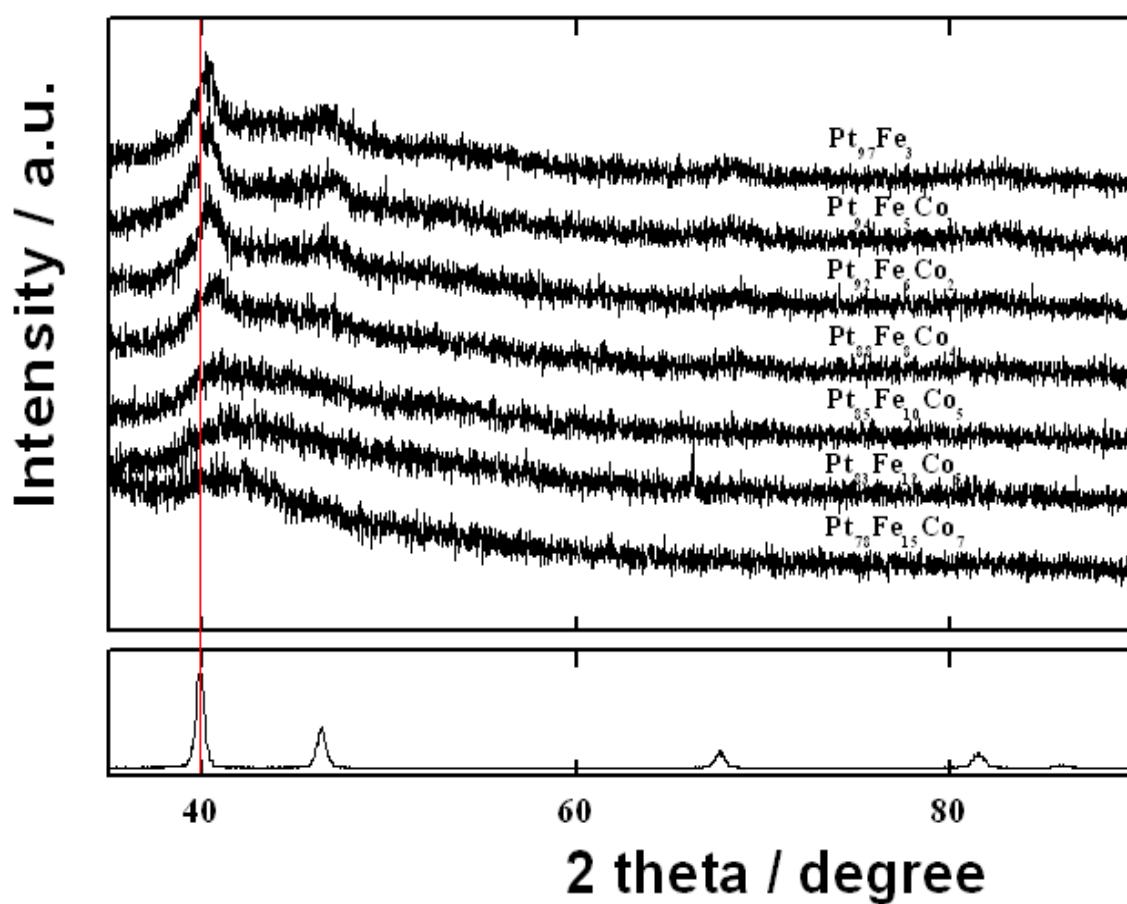
S9

**Figure S7: Vegard's law data**

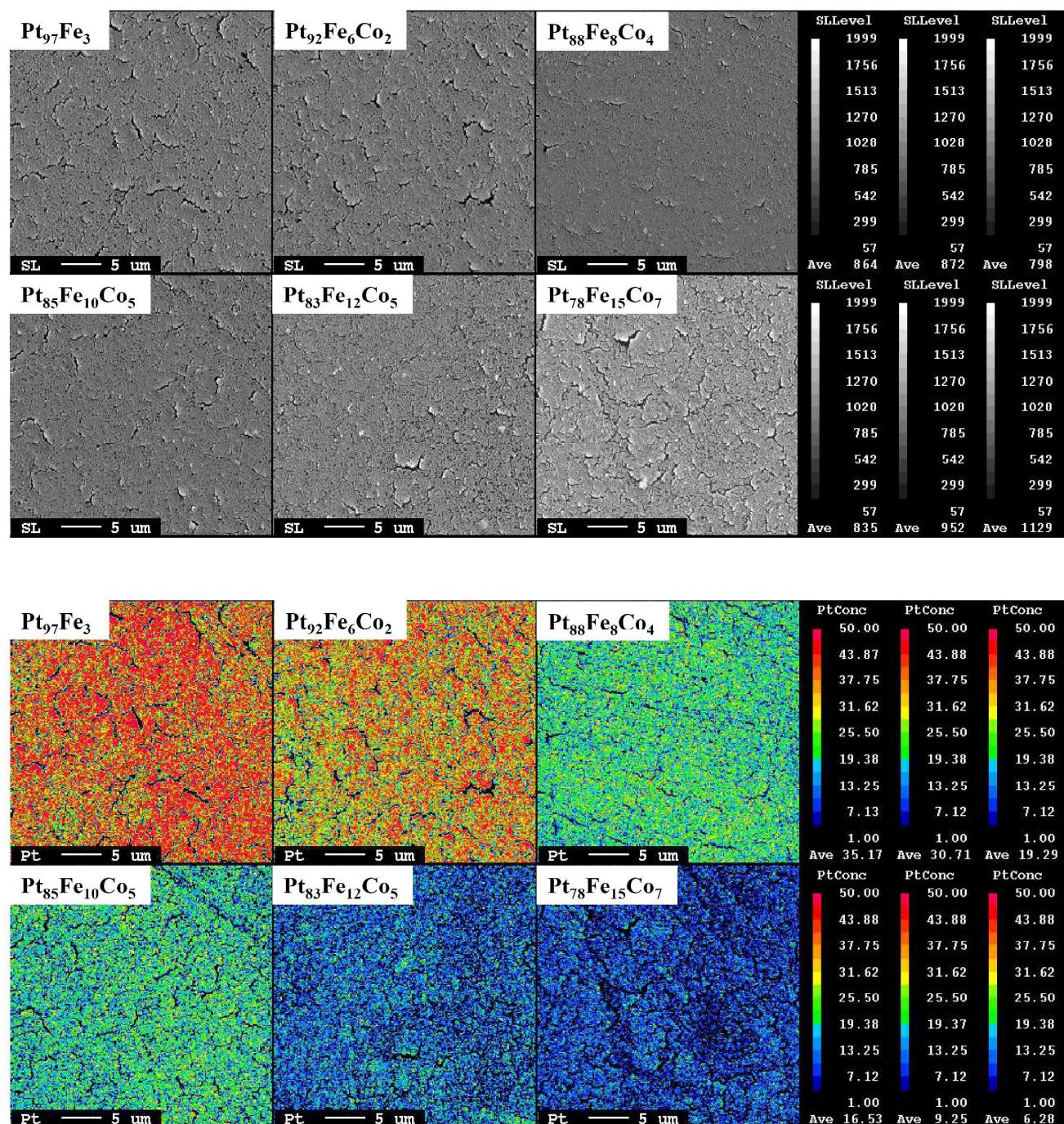
S11

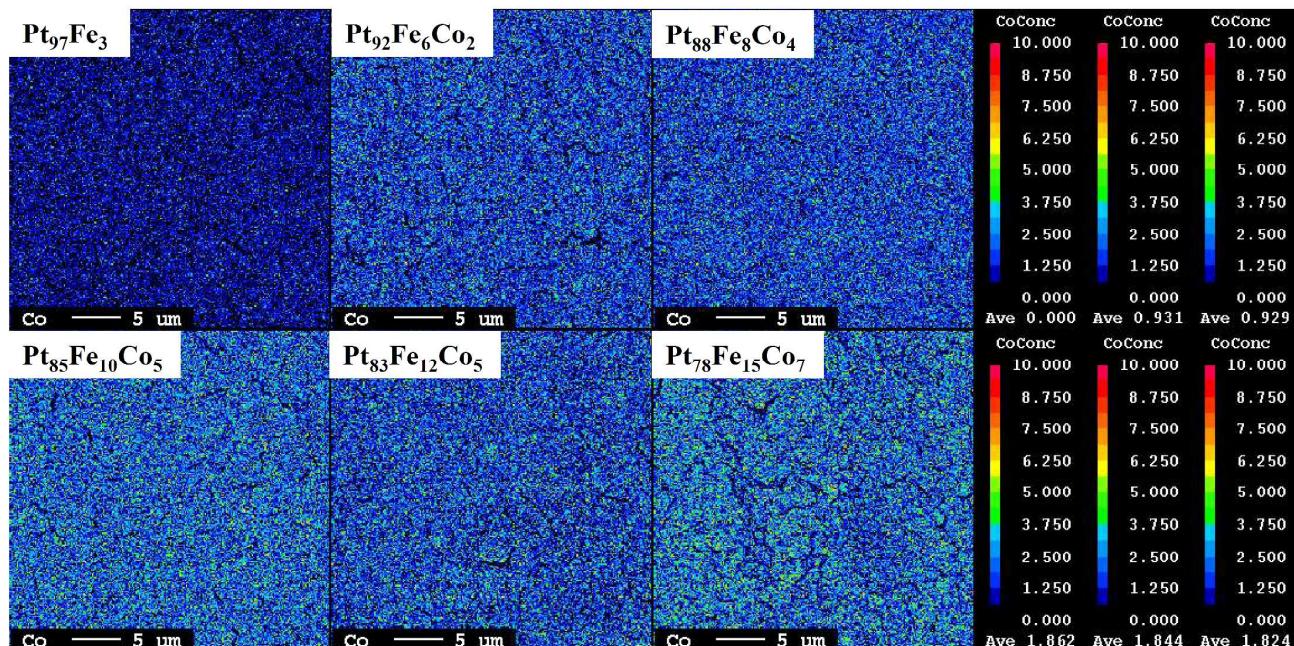
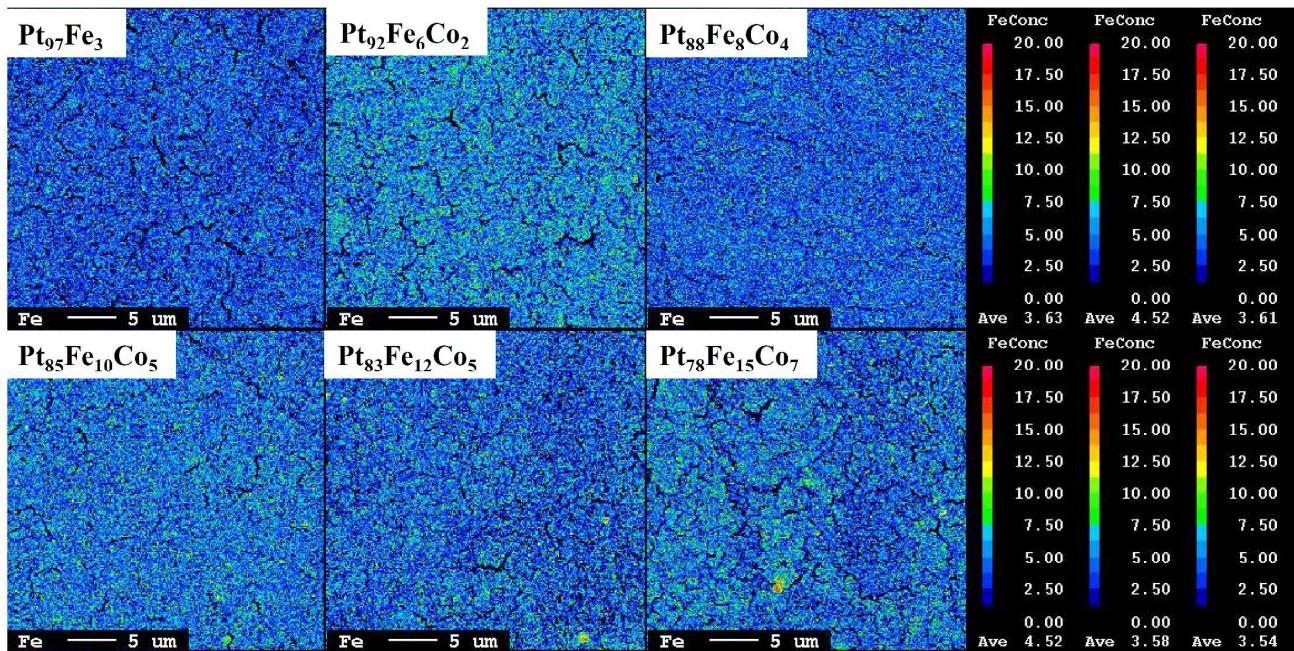
1	<b>Figure S8: XPS data</b>	S12
2		
3	<b>Figure S9: Pt(0), Pt(II), Pt(IV) ratio</b>	S13
4		
5	<b>Figrue S10: Pt 4f core level binding energy</b>	S14
6		
7	<b>Figure S11: Current density as a function of Pt binding energy</b>	S15
8		
9		
10		
11		
12		
13		
14	<b>Table 1. R-factor of the EXAFS fitting data</b>	S10
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		

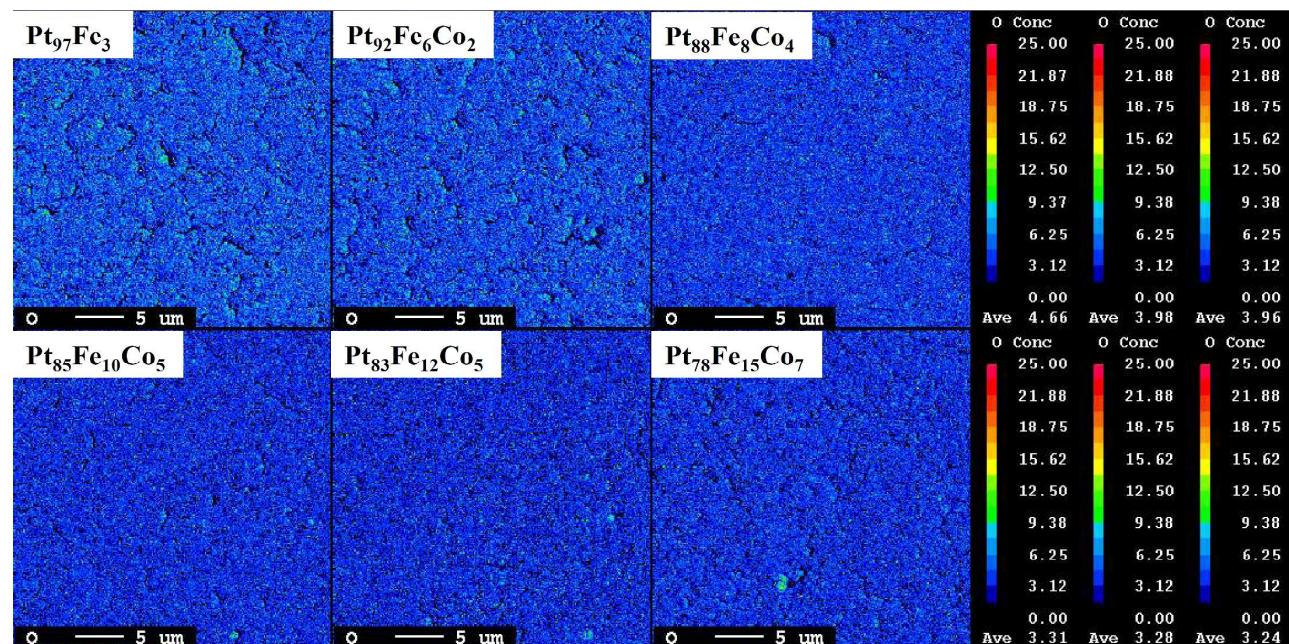
Figure S1. X-ray diffraction data

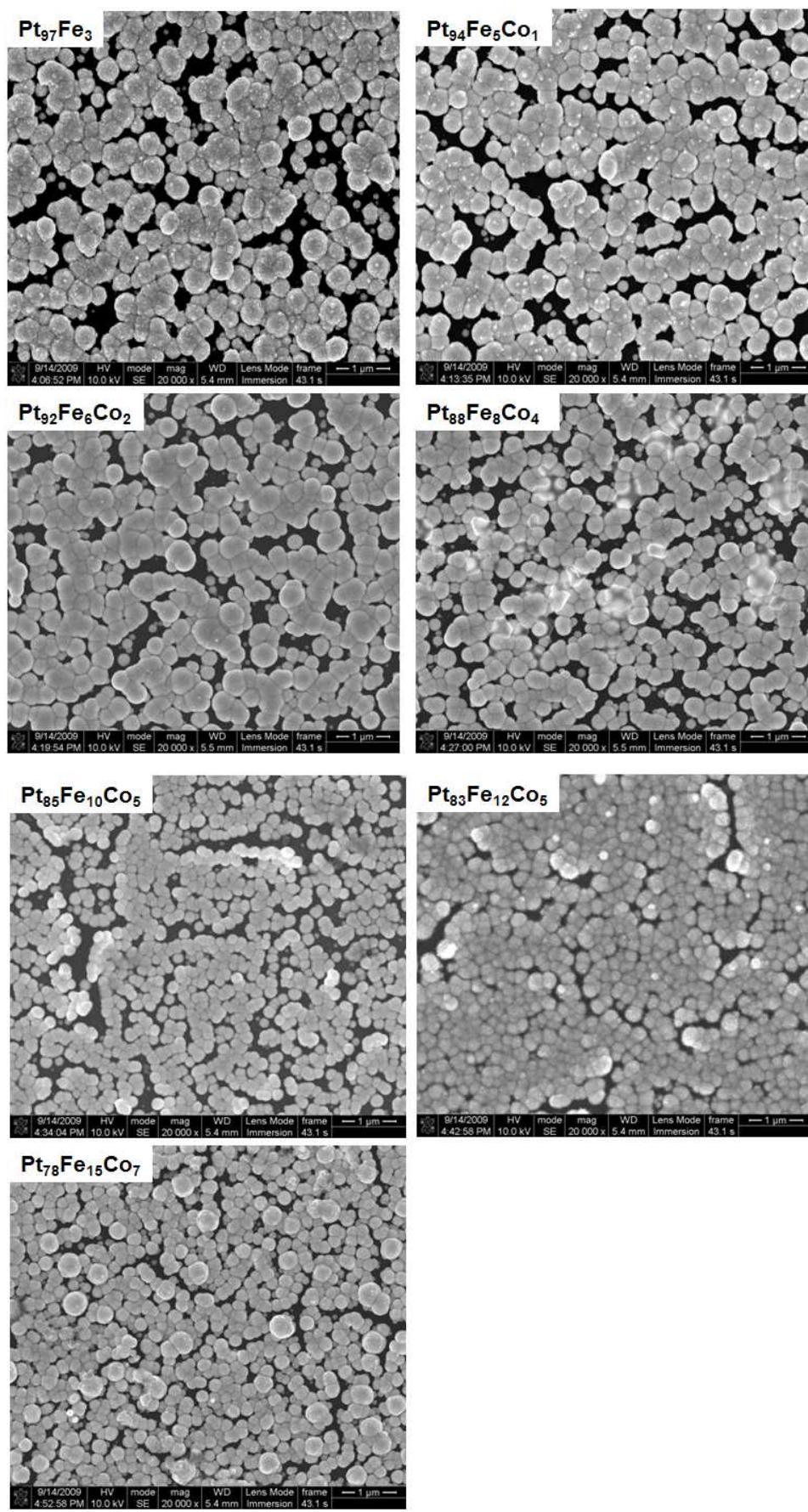


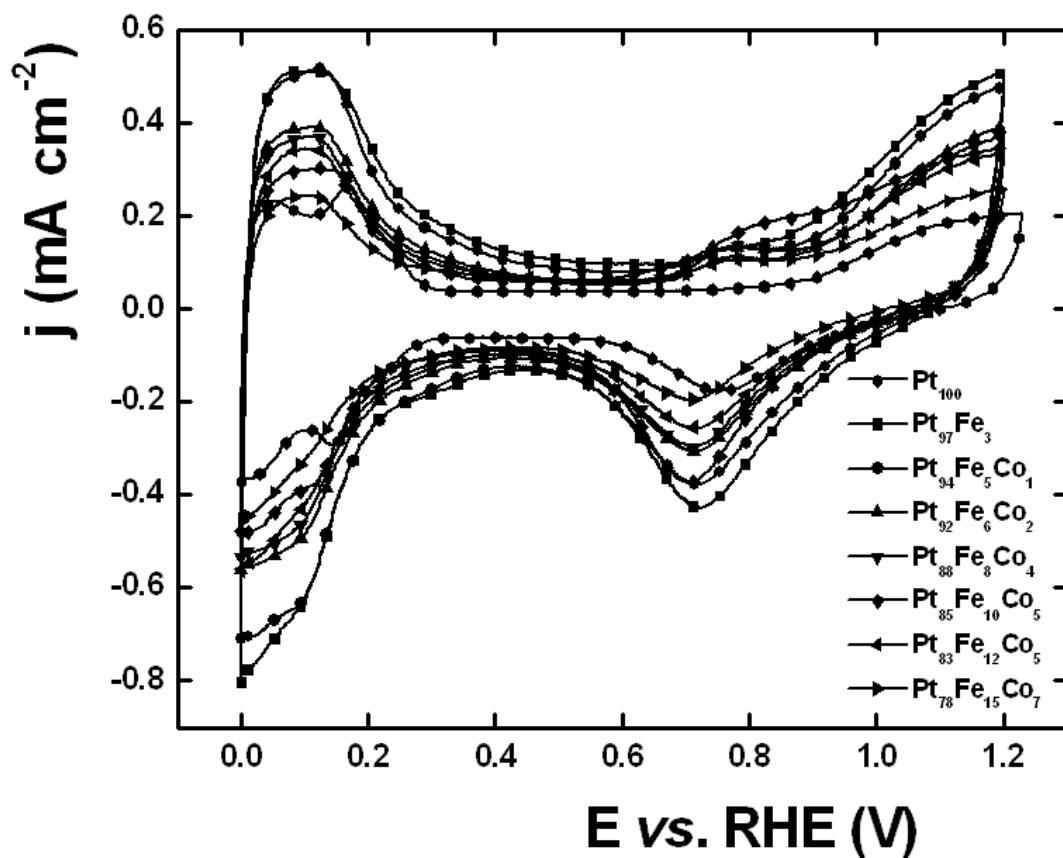
1  
2  
3  
4  
**Figure S2. EPMA data**

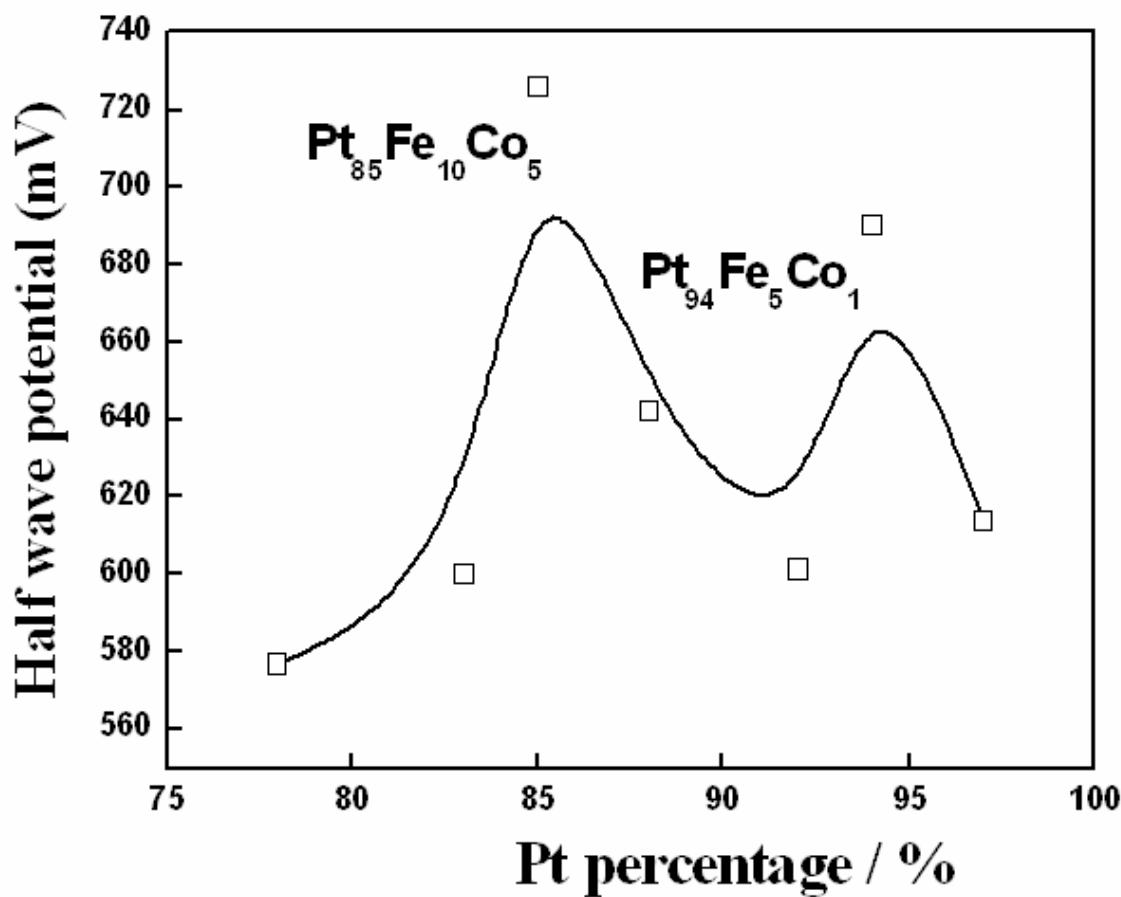


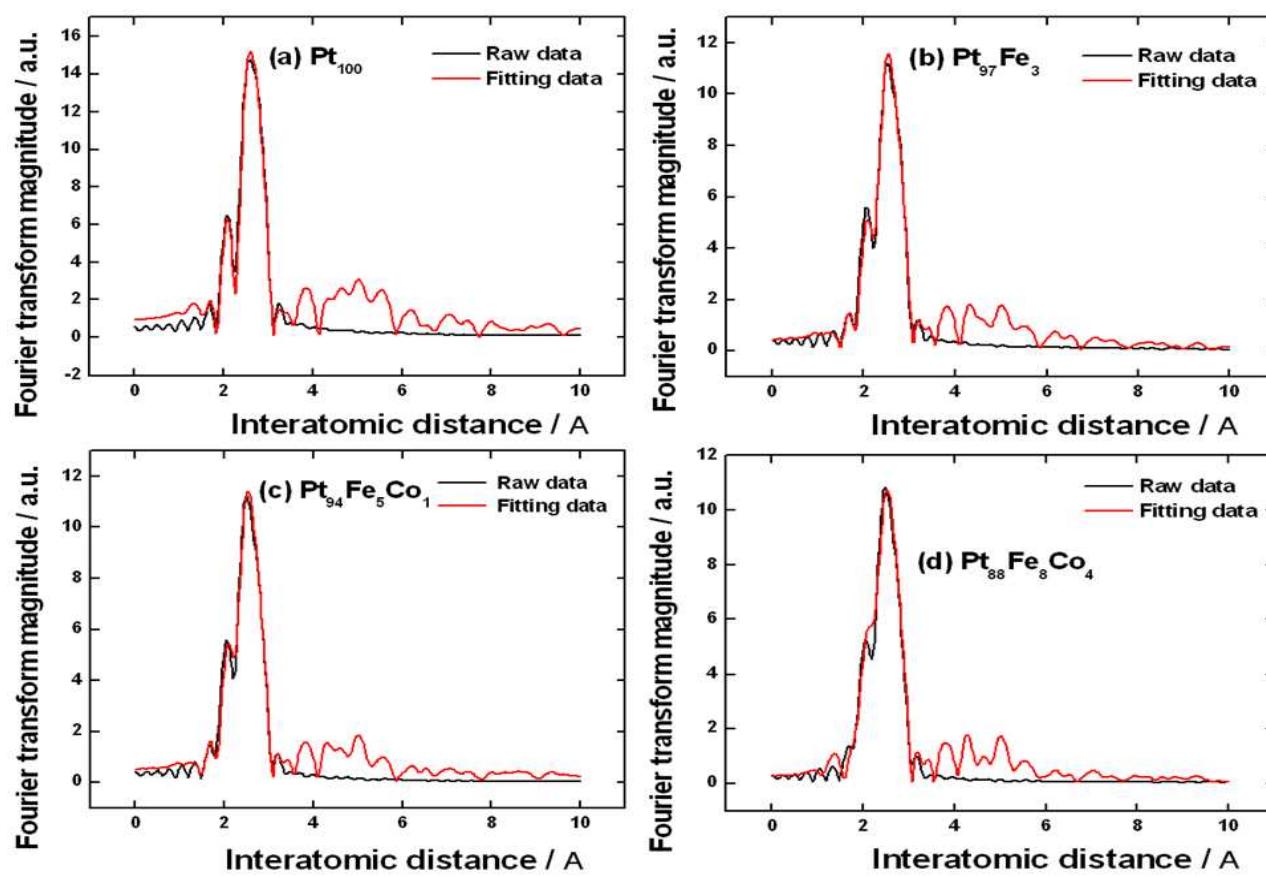


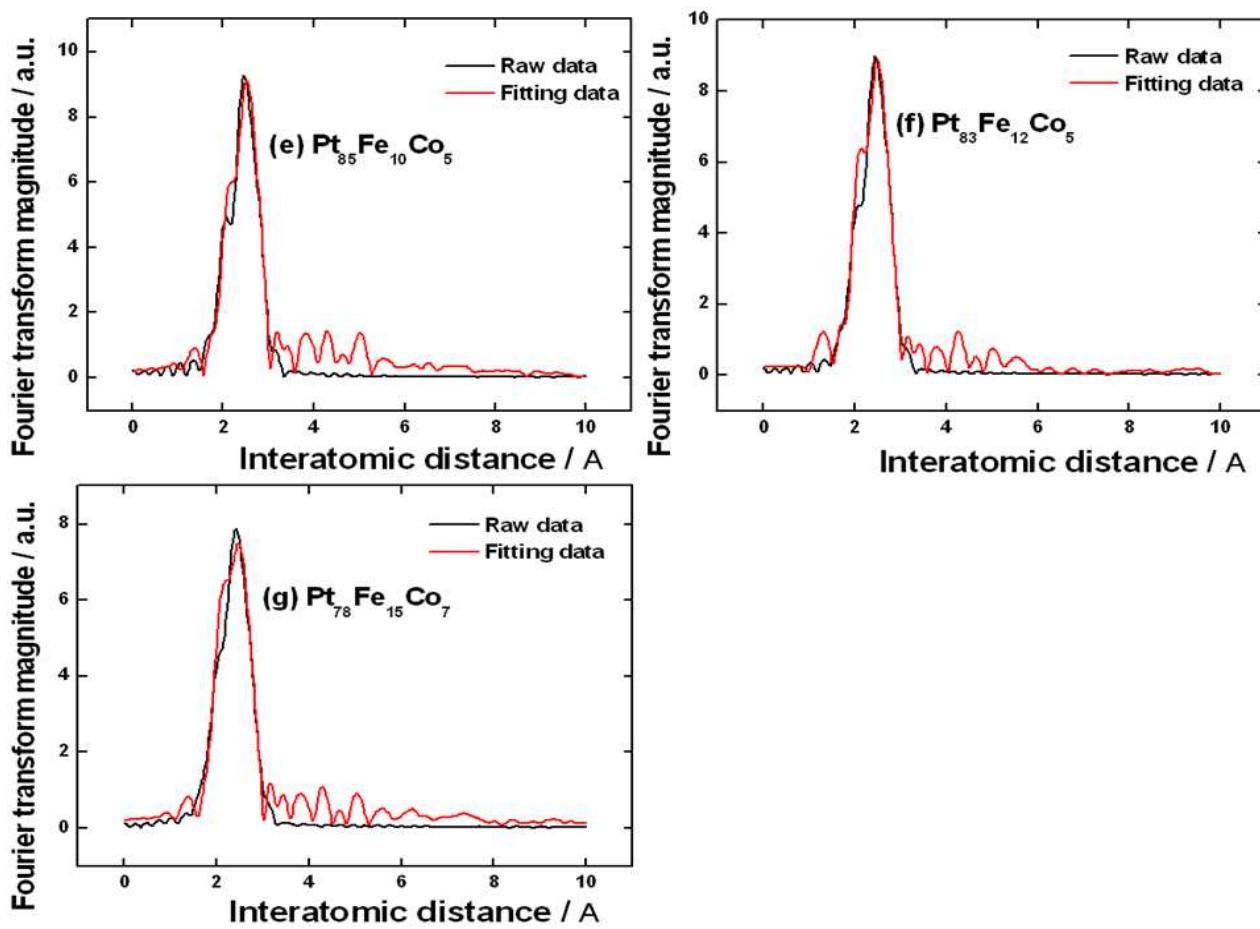


**Figure S3. SEM image**

**Figure S4. CV data**

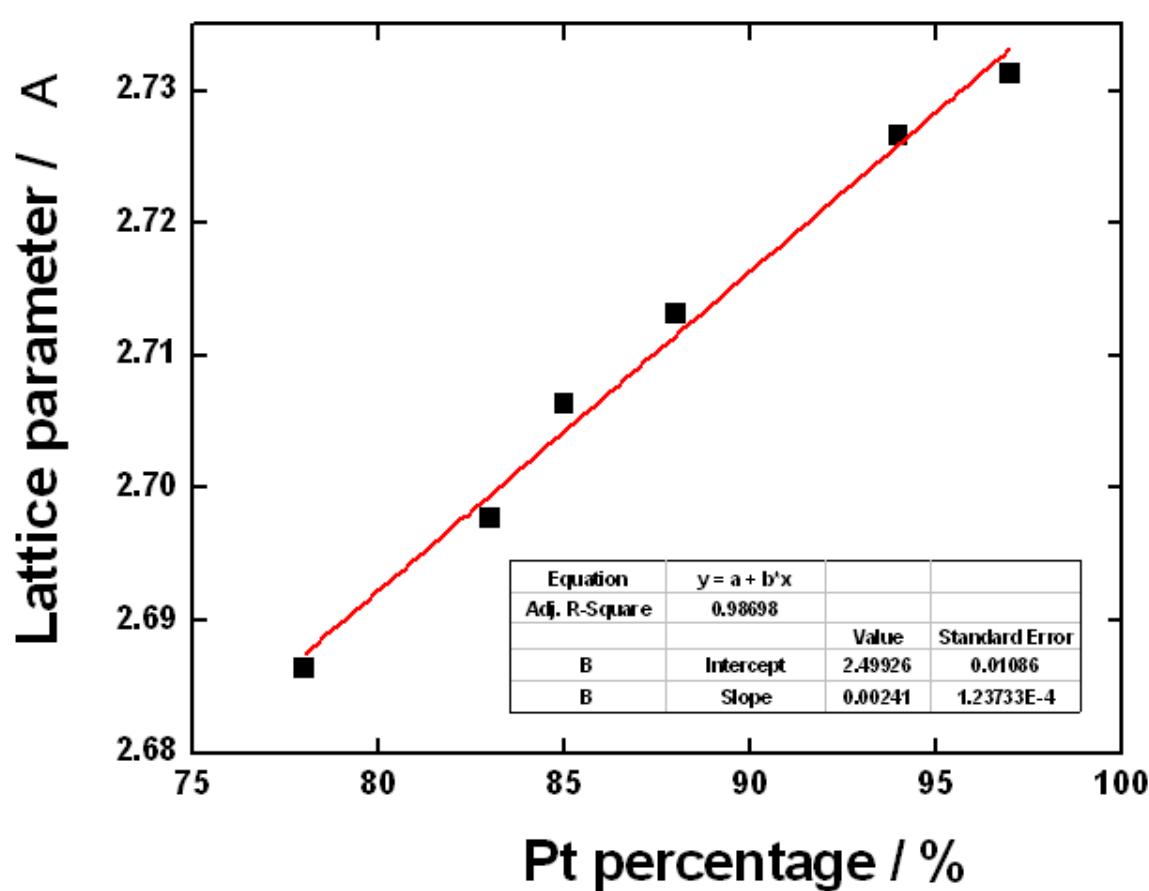
**Figure S5. Half wave potential**

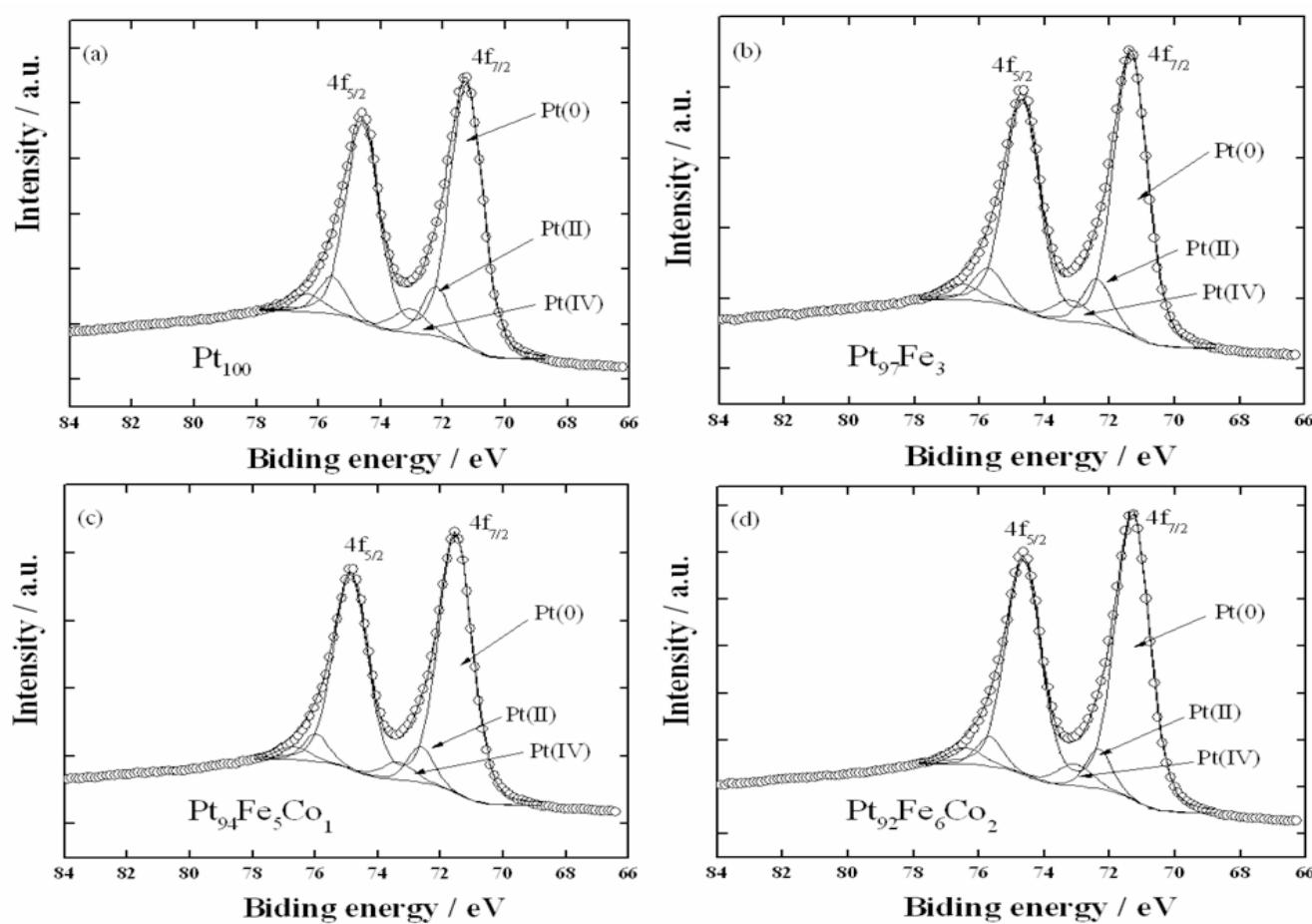
**Figure S6. EXAFS fitting data**



**Table 1. R-factor of the EXAFS fitting data**

Samples	$R_{factor}$ (%)
Pt <sub>97</sub> Fe <sub>3</sub>	0.7
Pt <sub>94</sub> Fe <sub>5</sub> Co <sub>1</sub>	1.3
Pt <sub>92</sub> Fe <sub>6</sub> Co <sub>2</sub>	0.9
Pt <sub>85</sub> Fe <sub>10</sub> Co <sub>5</sub>	2.5
Pt <sub>83</sub> Fe <sub>12</sub> Co <sub>5</sub>	2.8
Pt <sub>78</sub> Fe <sub>15</sub> Co <sub>7</sub>	4.2

**Figure S7.** Vegard's law data

**Figure S8. XPS data**

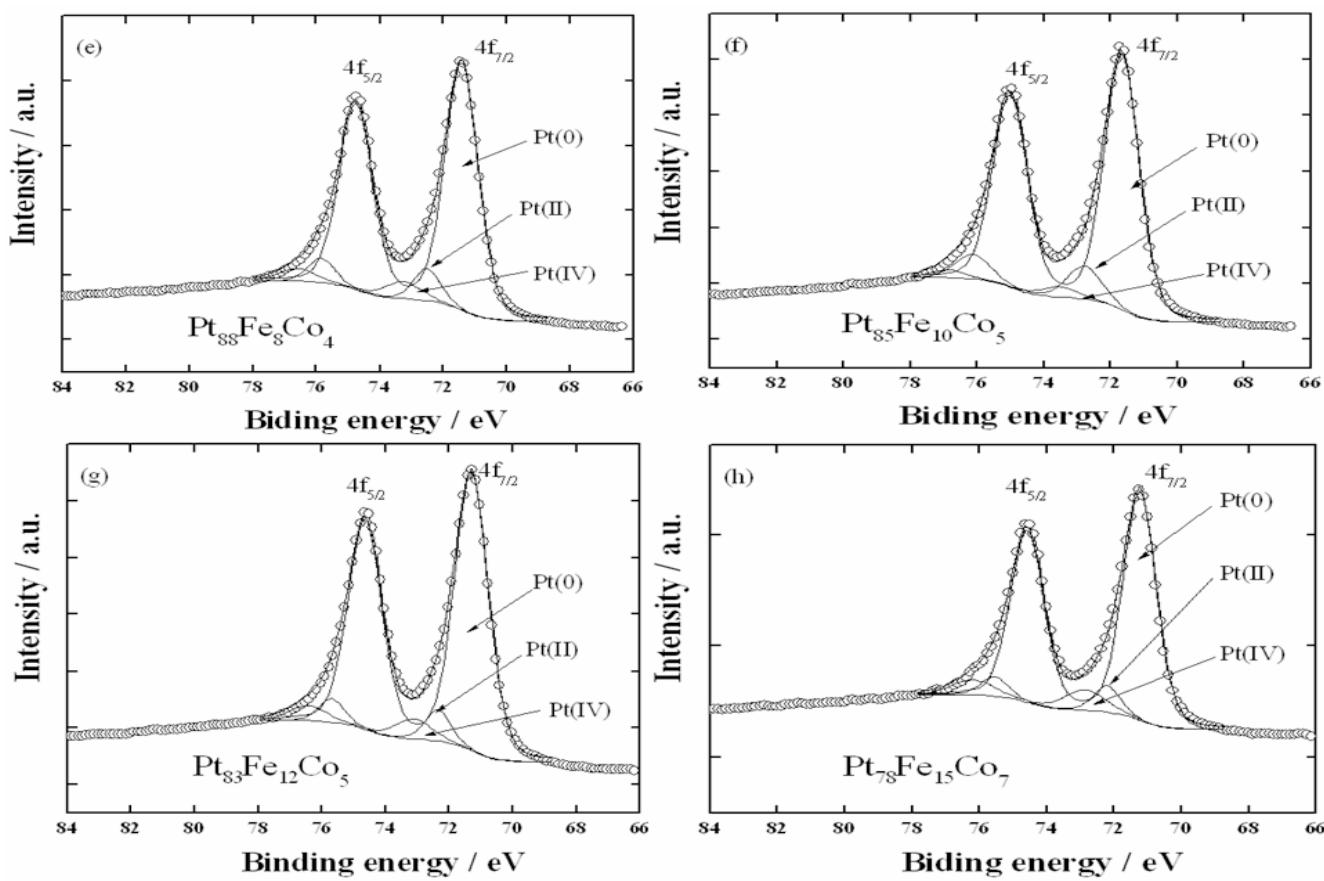


Figure S9. Pt(0), Pt(II), Pt(IV) ratio

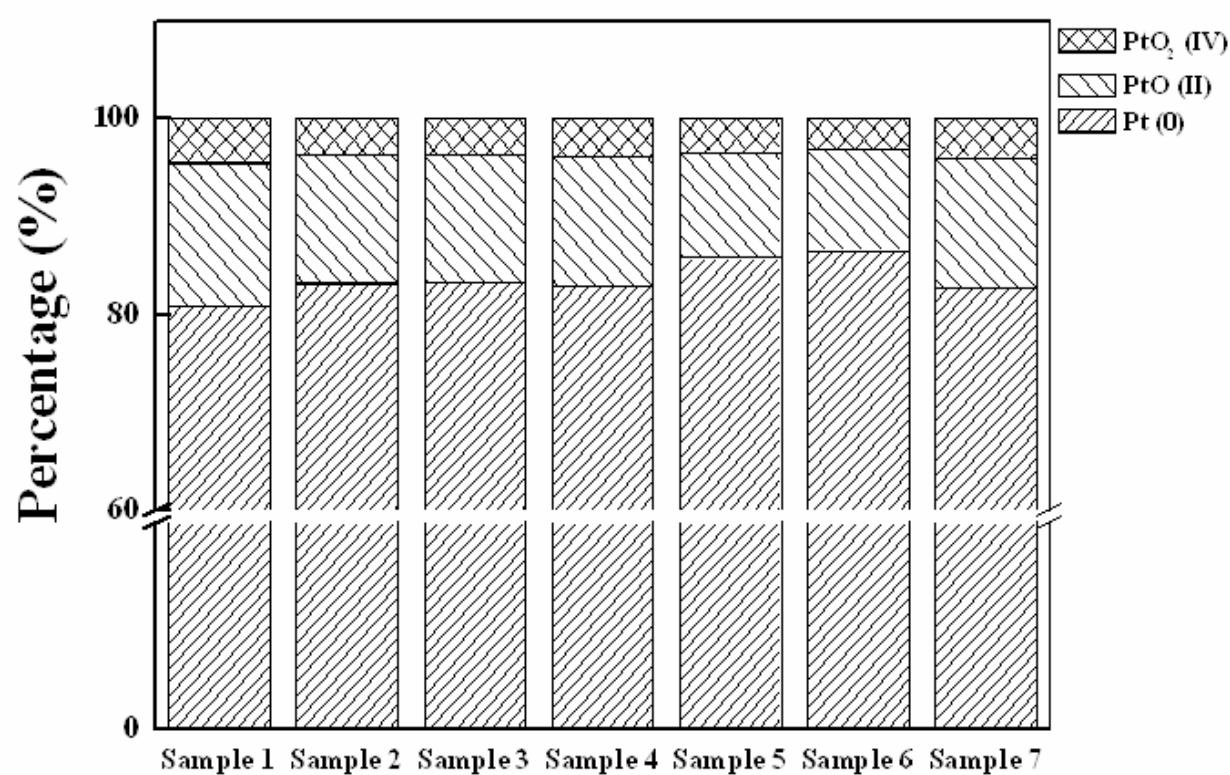
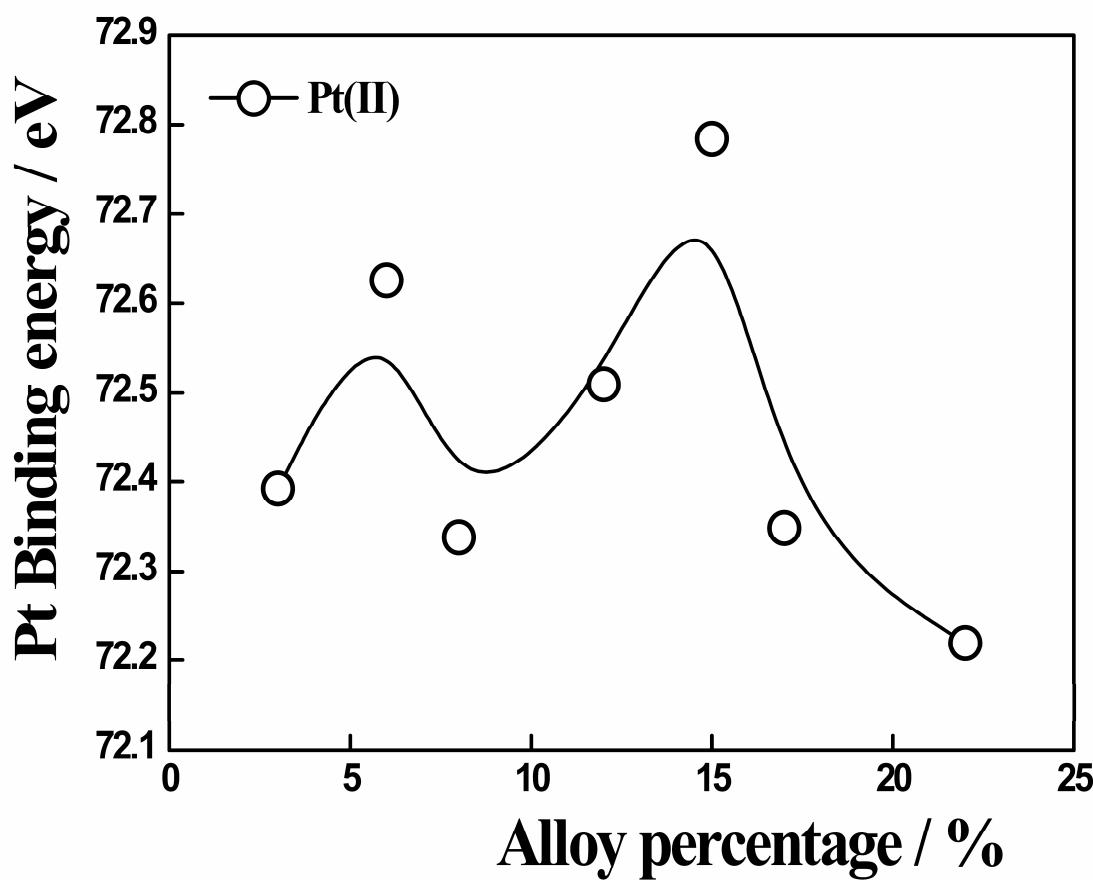


Figure S10. Pt 4f core level binding energy



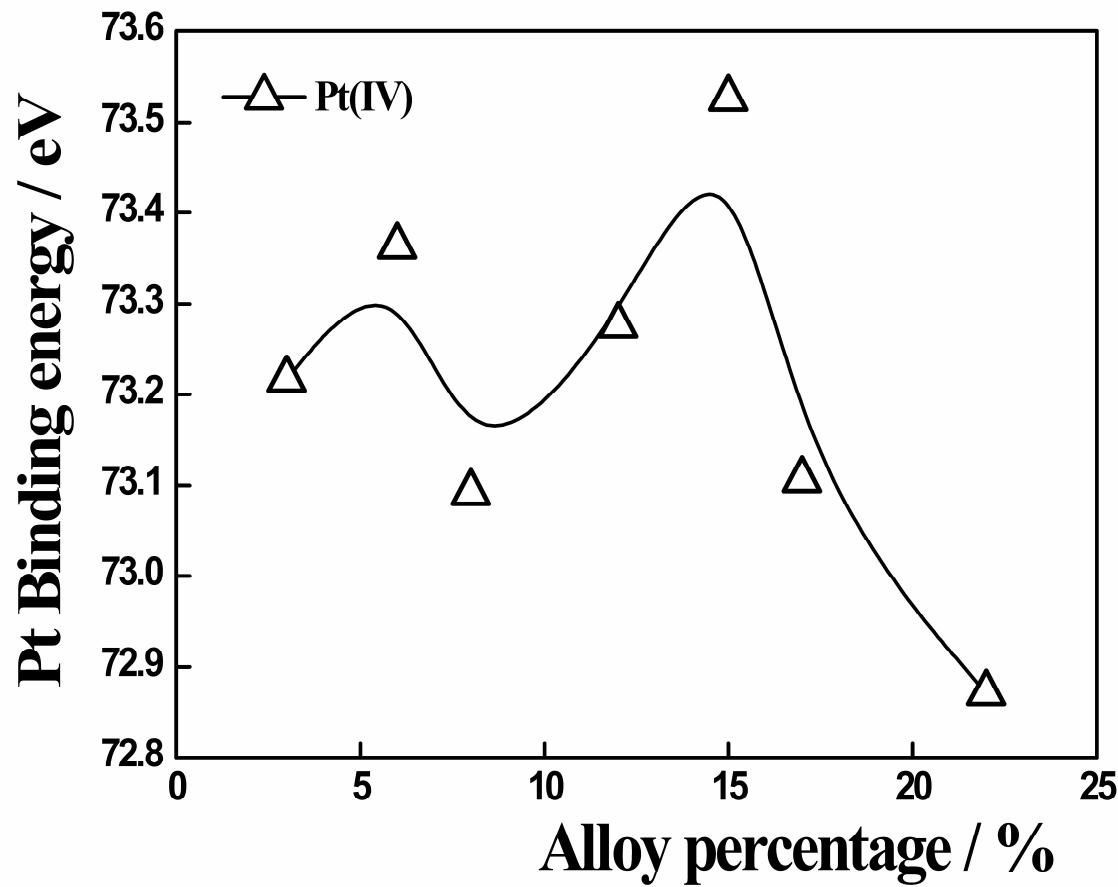


Figure S11. Current density as a function of Pt binding energy

