Chapter 5 Conclusions

Table 5.1 Comparison of two carbon nanomaterials

	Carbon nanotube on carbon cloth	Carbon nanoflake on carbon cloth
Growing catalyst	Fe	Fe
Bias	Negative	Negative turn to positive
Time (min)	20	20
Scale (nm)	10 (diameter)	10 (petal's thickness)
Surface area (cm^2/g)	90.31	130.96
Resistance (Ω/cm^2)	0.399	0.328
Cover performance	Not bad	Good
Conductivity	Good	Good
Electrochemical properties	0.05A	0.08A
Capacitance effect	weak	strong

Table 5.2 Comparison of two dispersing Pt methods

	Sputtering	Chemical solution
Preparing time	Short	Long
Manufacturing process	Simple	Complicate
Uniformity of Pt	Good	Bad
Particle size of Pt	2nm	2~5nm or more
Pt crystal	Single	Twin

1. Carbon nanoflakes could be obtained by switching bias from negative to positive during carbon nanotube producing process.
2. Negative and positive bias voltage or period time ratio attribute to porous size formed of curvature on carbon nanoflake, and the more equal they are, the more symmetrical twist petals we get.
3. In the suggestion that VLS mechanism is an initial stage for carbon nanotube, the defects surrounded are the second depositing sites for carbon nanoflake growing while significant positive bias is applying.
4. Carbon nanotubes and carbon nanoflakes on carbon cloth promote the surface areas and electrical conductivity which are suitable for electrode application; moreover carbon nanoflakes have better cover performance than carbon nanotubes on carbon cloth.
5. During dispersing Pt process, sputtering method is more convenient than chemical solution oxidation-reduction reaction. Sputtering could derive uniform nanoparticles of Pt at least for 2nm, however the other present inferior mixed unless proper pre-treatment.
6. Cyclic voltmmetry measurements reveal that in redox reaction of H-adsorption / desoption Pt / carbon nanoflakes are more efficient at creating current up to 0.08A than Pt / carbon nanotubes are.