

### **Pt, Pd catalysts - Hydrogenation**

0.1% Pt on activated carbon powder  
0.5% Pt on activated carbon powder  
1.0% Pt on activated carbon powder  
5.0% Pt on activated carbon powder  
10% Pt on activated carbon powder  
20% Pt on activated carbon powder  
0.1% Pt on granular carbon  
0.5% Pt on granular carbon  
1.0% Pt on granular carbon  
5.0% Pt on granular carbon  
0.1% Pd on activated carbon powder  
0.5% Pd on activated carbon powder  
1.0% Pd on activated carbon powder  
5.0% Pd on activated carbon powder  
10% Pd on activated carbon powder  
20% Pd on activated carbon powder  
0.1% Pd on granular carbon  
0.3% Pd on granular carbon  
0.5% Pd on granular carbon  
1.0% Pd on granular carbon  
5.0% Pd on granular carbon

### **Pt, Pd Catalysts - Red/Oxidation**

0.1% Pt on alumina powder  
0.5% Pt on alumina powder  
1.0% Pt on alumina powder  
5.0% Pt on alumina powder  
10% Pt on alumina powder  
20% Pt on alumina powder  
0.1% Pd on alumina powder  
0.5% Pd on alumina powder  
1.0% Pd on alumina powder  
5.0% Pd on alumina powder  
10% Pd on alumina powder  
20% Pd on alumina powder

### **Pt Catalysts - Electrochemecal**

5% Pt on Vulcan XC 72, fuel cell grade  
10% Pt on Vulcan XC 72, fuel cell grade  
20% Pt on Vulcan XC 72, fuel cell grade  
30% Pt on Vulcan XC 72, fuel cell grade  
40% Pt on Vulcan XC 72, fuel cell grade  
50% Pt on Vulcan XC 72, fuel cell grade  
60% Pt on Vulcan XC 72, fuel cell grade  
80% Pt on Vulcan XC 72, fuel cell grade  
Pt Black, High surface area: 45-52 m<sup>2</sup>/g

#### **Fe,Co,Ni,Cu,Zn,Ag, Sn Catalysts**

1% Fe on Carbon Black  
5% Fe on Carbon Black  
10% Fe on Carbon Black  
20% Fe on Carbon Black  
1% Co on Carbon Black  
5% Co on Carbon Black  
10% Co on Carbon Black  
20% Co on Carbon Black  
1% Ni on Carbon Black  
5% Ni on Carbon Black  
10% Ni on Carbon Black  
20% Ni on Carbon Black  
1% Cu on Carbon Black  
5% Cu on Carbon Black  
10% Cu on Carbon Black  
20% Cu on Carbon Black  
1% Zn on Carbon Black  
5% Zn on Carbon Black  
10% Zn on Carbon Black  
20% Zn on Carbon Black  
1% Sn on Carbon Black  
5% Sn on Carbon Black  
10% Sn on Carbon Black  
20% Sn on Carbon Black  
20% Ag on Vulcan XC-72  
40% Ag on Vulcan XC-72

### **Pt Alloy Catalysts**

10% Pt-Ru (1:1 ratio) on Vulcan XC-72  
20% Pt-Ru (1:1 ratio) on Vulcan XC-72  
30% Pt-Ru (1:1 ratio) on Vulcan XC-72  
40% Pt-Ru (1:1 ratio) on Vulcan XC-72  
50% Pt-Ru (1:1 ratio) on Vulcan XC-72  
60% Pt-Ru (1:1 ratio) on Vulcan XC-72  
80% Pt-Ru (1:1 ratio) on Vulcan XC-72  
Pt-Ru (1:1 ratio) Black  
20% Pt-Pd (1:1 ratio) on Vulcan XC-72  
40% Pt-Pd (1:1 ratio) on Vulcan XC-72  
Pt-Pd (1:1 ratio) Black  
20% Pt-Ir (1:1 ratio) on Vulcan XC-72  
40% Pt-Ir (1:1 ratio) on Vulcan XC-72  
20% Pt-Fe (1:1 ratio) on Vulcan XC-72  
40% Pt-Fe (1:1 ratio) on Vulcan XC-72  
20% Pt-Co (1:1 ratio) on Vulcan XC-72  
40% Pt-Co (1:1 ratio) on Vulcan XC-72  
20% Pt-Ni (1:1 ratio) on Vulcan XC-72  
40% Pt-Ni (1:1 ratio) on Vulcan XC-72  
40% Pt-Ni (3:1 ratio) on Vulcan XC-72  
20% Pt-Cu (1:1 ratio) on Vulcan XC-72  
40% Pt-Cu (1:1 ratio) on Vulcan XC-72  
20% Pt-Sn (3:1 ratio) on Vulcan XC-72  
40% Pt-Sn (3:1 ratio) on Vulcan XC-72

### **Pd,Ru,Ir,Au Catalysts**

5% Pd on Vulcan XC-72  
10% Pd on Vulcan XC-72  
20% Pd on Vulcan XC-72  
40% Pd on Vulcan XC-72  
60% Pd on Vulcan XC-72  
80% Pd on Vulcan XC-72  
Pd Black, High surface area 42~48 m<sup>2</sup>/g  
20% Ru on Vulcan XC-72  
40% Ru on Vulcan XC-72  
Ru Black, High surface area 34~38 m<sup>2</sup>/g  
20% Ir on Vulcan XC-72

40% Ir on Vulcan XC-72

Ir Black, High Surface area, 65~75 m<sup>2</sup>/g

IrO<sub>2</sub> powder, conductive, Surface area 20~30 m<sup>2</sup>/g

20% Au on Vulcan XC-72

40% Au on Vulcan XC-72

60% Au on Vulcan XC-72