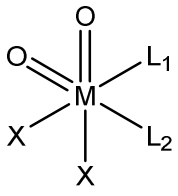
Claims

We Claim:

1. A process for forming a material on a substrate, comprising contacting the substrate with a compound of the Formula (I)



(I),

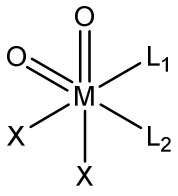
wherein M is molybdenum, X is chloro, and L_1 and L_2 are acetonitrile; and
depositing the molybdenum-containing material onto the substrate under vapor deposition conditions, wherein the compound of the Formula (I) has an orthorhombic crystal system, and unit cell dimensions of about

a= 12.0350(8) Å $\alpha = 90°$

b= 11.5956(9) Å $\beta = 90°$

c = 26.5807(15) Å $\gamma = 90°$.

2. A process for forming a material on a substrate, comprising
contacting the substrate with a compound of the Formula (I)



(I),

wherein M is tungsten, X is chloro, and L_1 and L_2 are acetonitrile; and
depositing the tungsten-containing material onto the substrate under vapor deposition conditions,
wherein the compound of the Formula (I) has an orthorhombic crystal system, and unit cell dimensions of about

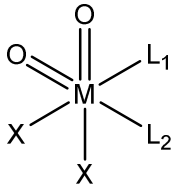
a= 8.7091(6) Å $\alpha = 90°$

b= 8.2536(7) Å $\beta = 90°$

c = 12.5437(8) Å $\gamma = 90°$.

3. A process for forming a material on a substrate, comprising

contacting the substrate with a compound of the Formula (I)



(I),

wherein M is molybdenum, X is chloro, and L_1 and L_2 are tetrahydrofuran; and

depositing the molybdenum-containing material onto the substrate under vapor deposition conditions,

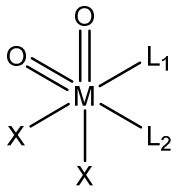
wherein the compound of Formula (I) has an orthorhombic crystal system, and unit cell dimensions of about

a= 7.4048(4) Å $\alpha = 90°$

b= 12.5437(6) Å $\beta = 90°$

c = 13.7487(7) Å $\gamma = 90°$.

4. A compound of Formula (I)



(I),

wherein M is molybdenum, X is chloro, and L_1 and L_2 are acetonitrile; and

wherein the compound of Formula (I) is in crystalline form and has less than 1% impurities by weight, and

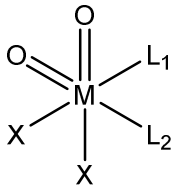
wherein the compound of the Formula (I) has an orthorhombic crystal system, and unit cell dimensions of about

a= 12.0350(8) Å $\alpha = 90°$

b= 11.5956(9) Å $\beta = 90°$

c = 26.5807(15) Å $\gamma = 90°$.

5. A compound of Formula (I)



(I),

wherein M is tungsten, X is chloro, and L_1 and L_2 are acetonitrile; and

wherein the compound of Formula (I) is in crystalline form and has less than 1% impurities by weight, and

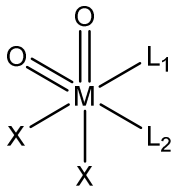
wherein the compound of the Formula (I) has an orthorhombic crystal system, and unit cell dimensions of about

a= 8.7091(6) Å $\alpha = 90°$

b= 8.2536(7) Å $\beta = 90°$

c = 12.5437(8) Å $\gamma = 90°$.

6. A compound of Formula (I)



(I),

wherein M is molybdenum, X is chloro, and L_1 and L_2 are tetrahydrofuran; and

wherein the compound of Formula (I) is in crystalline form and has less than 1% impurities by weight, and

wherein the compound of the Formula (I) has an orthorhombic crystal system, and unit cell dimensions of about

a= 7.4048(4) Å $\alpha = 90°$

b= 12.5437(6) Å $\beta = 90°$

c = 13.7487(7) Å $\gamma = 90°$.