Claims

1. A method for producing MoO_2Cl_2 under inert conditions, comprising the steps of:

charging a reaction vessel with MoO_2;

reacting the MoO_2 with supplied Cl_2 in the reaction vessel at a first temperature T_1 to give gaseous MoO_2Cl_2;

transferring the gaseous MoO_2Cl_2 into a receiving vessel;

resublimating the gaseous MoO_2Cl_2 in the receiving vessel to give solid MoO_2Cl_2 at a second temperature T_2 that is lower than T_1, wherein the second temperature T_2 in the receiving vessel decreases during the method for producing MoO_2Cl_2; and

recovering solid MoO_2Cl_2 with a purity determined by ICP-OES/MS of 99.9996 wt.% or more,

wherein the reaction vessel and the receiving vessel are excluded from pressure reduction operations.

2. The method according to claim 1, wherein solid MoO_2Cl_2 with a purity determined by ICP-OES/MS of 99.99969 wt.% or more is recovered.

3. The method according to at least one of the preceding claims, wherein solid MoO_2Cl_2 with a tungsten content determined by ICP-OES/MS of ≤ 200 ppb is recovered.

4. The method according to at least one of the preceding claims, wherein the first temperature T_1 is ≥ 170°C and/or the second temperature T_2 is ≤ 160°C.

5. The method according to at least one of the preceding claims, wherein transferring the gaseous MoO_2Cl_2 into the receiving vessel is carried out at a temperature of ≥ 160°C.

6. The method according to at least one of the preceding claims, wherein the gas flow of the supplied Cl_2 is 0.01 to 1 L/min.

7. The method according to at least one of the preceding claims, wherein an inert gas is additionally supplied with the supplied Cl_2.

8. The method according to claim 7, wherein the gas flow of the inert gas is 0.05 to 0.4 L/min.

9. The method according to at least one of the preceding claims, wherein, before charging the reaction vessel with the MoO_2, the reaction vessel and the receiving vessel are inertized by flushing with an inert gas.

10. The method according to at least one of the preceding claims, wherein the recovered solid MoO_2Cl_2 is further purified by sublimation and resublimation.

11. A method for producing a molybdenum-containing layer, comprising a method according to at least one of the preceding claims, wherein subsequently the recovered solid MoO_2Cl_2 is used in a vapor deposition as a precursor in order to form the molybdenum-containing layer.