Claims

1. A deposition method, comprising:

providing a channel for a substrate through a deposition apparatus,

feeding precursor vapor into the channel;

depositing material from the precursor vapor onto the substrate on its way through the deposition apparatus by exposing the substrate to the precursor vapor and to alternating photon exposure and shade periods within the channel, the method comprising:

defining photon exposure and shade periods by shading the substrate surface so that an area of shade has the shade period and a non-shaded area has the photon exposure period.

2. The method of claim 1, wherein the channel restricts movement of the precursor vapor in a vertical direction.

3. The method of claim 1 or 2, wherein the precursor vapor comprises a first precursor species and a second precursor source gas, the second precursor source gas functioning as carrier gas for the first precursor species.

4. The method of any preceding claim, wherein a first precursor species reacts with reactive sites on the substrate surface on the shade period and, on the following photon exposure period, a second precursor species reacts with chemisorbed first precursor species.

5. The method of claim 4, comprising:

causing the reaction on the photon exposure period by received photon energy.

6. The method of any preceding claim, wherein reactions during the shade period are self-saturative surface reactions.

7. A deposition apparatus, comprising:

a channel for a substrate through the deposition apparatus;

at least one in-feed line for feeding precursor vapor into the channel, the deposition apparatus being further configured to

deposit material from the precursor vapor onto the substrate on its way through the deposition apparatus by exposing the substrate to the precursor vapor and to alternating photon exposure and shade periods within the channel, the apparatus being configured to define photon exposure and shade periods by shading the substrate surface so that an area of shade has the shade period and a non-shaded area has the photon exposure period.

8. The apparatus of claim 7, the channel being configured to restrict movement of the precursor vapor in a vertical direction.

9. The apparatus of claim 7 or 8, wherein the precursor vapor comprises a first precursor species and a second precursor source gas, and the apparatus is configured to use the second precursor source gas as carrier gas for the first precursor species.

10. The apparatus of any preceding claim 7-9, wherein the apparatus is configured to cause:

a first precursor species to react with reactive sites on the substrate surface on the shade period and, on the following photon exposure period, a second precursor species to react with chemisorbed first precursor species.

11. The apparatus of claim 10, comprising:

a photon source configured to emit photon energy to cause the reaction on the photon exposure period.

12. The apparatus of any preceding claim 7-11, comprising:

a shader in between the substrate and a photon source having photon permeable areas and photon impermeable areas to define photon exposure and shade periods by shading the substrate surface so that an area of shade has the shade period and a non-shaded area has the photon exposure period.