What is claimed is:

1. A method of selectively depositing polysilicon, the method comprising:

depositing a first silicon (Si) layer by physical vapor deposition (PVD) on a semiconductor substrate surface with at least one feature formed thereon, the at least one feature having at least one opening at a top surface with an opening width, at least one sidewall, and a bottom, the at least one feature extending a feature depth from the top surface to the bottom, the first silicon (Si) layer forming on the top surface, along the at least one sidewall, and the bottom;

forming a flowable polymer film on the first silicon (Si) layer within the at least one feature, the flowable polymer film forming on the first silicon (Si) layer on the bottom and having a polymer depth less than or equal to the feature depth;

selectively removing at least a portion of the first silicon (Si) layer from the top surface and the at least one sidewall; and

removing the flowable polymer film to expose the first silicon (Si) layer on the bottom of the at least one feature.

2. The method of claim 1, wherein forming the flowable polymer film comprises exposing the semiconductor substrate surface to one or more monomers and forming the flowable polymer film is performed at a temperature in a range of from 30 °C to 400 °C.

3. The method of claim 2, wherein the one or more monomers includes a single monomer selected from the group consisting of a methyl group, a methacrylate group, a styrene group, a benzyl alcohol group, a benzyl chloride group, and an aldehyde group.

4. The method of claim 2, wherein the one or more monomers includes two monomers, each monomer independently selected from the group consisting of

amines with bi-functional groups, aldehydes with bi-functional groups, ketones with bi-functional groups, and alcohols with bi-functional groups.

5. The method of claim 4, wherein the one or more monomers includes three monomers, wherein two of the monomers independently comprise one or more of an amine with a single functional group, an aldehyde with a single functional group, a ketone with a single functional group, or an alcohol with a single functional group, and at least one of the monomers is independently selected from the group consisting of amines with bi-functional groups, aldehydes with bi-functional groups, ketones with bi-functional groups, and alcohols with bi-functional groups.

6. The method of claim 1, wherein selectively removing the portion of the first silicon (Si) layer includes exposing the semiconductor substrate surface to a fluorine-based plasma or a chlorine-based plasma, and selectively removing the portion of the first silicon (Si) layer is performed at a temperature in a range of from 100 °C to 400 °C.

7. The method of claim 1, wherein the flowable polymer film is removed by exposing the semiconductor substrate surface to one or more of a thermal process or a hydrogen (H_2) plasma treatment, and wherein the flowable polymer film is removed without substantially affecting any material beneath the flowable polymer film.

8. The method of claim 1, comprising repeating the operations of: forming a flowable polymer film on the first silicon (Si) layer, selectively removing at least a portion of the first silicon (Si) layer from the top surface and the at least one sidewall, and removing the flowable polymer film.

9. The method of claim 1, wherein the feature depth is in a range of about 10 nm to about 300 nm.

10. The method of claim 1, wherein the polymer depth is in a range of about 1 nm to about 50 nm.

11. A method of selectively depositing polysilicon, the method comprising:

depositing a first silicon (Si) layer by physical vapor deposition (PVD) on a semiconductor substrate surface with at least one feature formed thereon, the at least one feature having at least one opening at a top surface with an opening width, at least one sidewall, and a bottom, the at least one feature extending a feature depth from the top surface to the bottom, the first silicon (Si) layer forming on the top surface, along the at least one sidewall, and the bottom;

forming a flowable polymer film on the first silicon (Si) layer within the at least one feature, the flowable polymer film forming on the first silicon (Si) layer on the bottom and having a polymer depth less than or equal to the feature depth;

selectively removing at least a portion of the first silicon (Si) layer from the top surface and the at least one sidewall without substantially affecting any material beneath the flowable polymer film;

removing the flowable polymer film to expose the first silicon (Si) layer on the bottom; and

oxidizing the remaining portion of the first silicon (Si) layer to form a first silicon oxide (SiOx) layer on the bottom.

12. The method of claim 11, wherein forming the flowable polymer film comprises exposing the semiconductor substrate surface to one or more monomers.

13. The method of claim 11, wherein the flowable polymer film is removed by exposing the semiconductor substrate surface to one or more of a thermal process or a hydrogen (H_2) plasma treatment, and wherein the flowable polymer film is removed without substantially affecting any material beneath the flowable polymer film.

14. The method of claim 11, comprising repeating the operations of: forming the flowable polymer film on the first silicon (Si) layer, selectively removing at least a

portion of the first silicon (Si) layer from the top surface and the at least one sidewall, removing the flowable polymer film, and oxidizing the remaining portion of first silicon (Si) layer.

15. The method of claim 11, further comprising: selectively depositing a second silicon (Si) layer on the first silicon oxide (SiOx) layer to fill the feature depth after removing the flowable polymer film; and oxidizing the second silicon (Si) layer to form a second silicon oxide (SiOx) layer.