CLAIMS

~~What is claimed is:~~

1. A method for etching features in a silicon layer disposed below a mask in a plasma processing chamber, comprising a plurality of cycles, wherein each cycle comprises:

providing a deposition phase forming a deposition on the silicon layer in the plasma processing chamber, comprising;

providing a deposition gas into the plasma processing chamber wherein the deposition gas comprises a halogen containing etchant component and a fluorocarbon deposition component;

forming the deposition gas into a plasma, which provides a net deposition on the silicon layer; and

stopping the flow of the deposition gas; and

providing a silicon etch phase, comprising;

providing a silicon etch gas into the plasma processing chamber that is different than the deposition gas;

forming the silicon etch gas into a plasma to etch the silicon layer; and

stopping the flow of the silicon etch gas.

2. The method, as recited in claims 1, wherein the providing the deposition phase further comprises providing a bias of 50 to 300 volts.

3. The method, as recited in 2, wherein the halogen of the halogen containing etchant component comprises at least one of fluorine, bromine, or chlorine.

4. The method, as recited in claim 3, wherein the halogen containing etchant is at least one of SF_6, CF_4, or NF_3.

different than the deposition gas;

providing a bias of 50 to 200 volts;

forming the silicon etch gas into a plasma to etch the silicon layer; and

stopping the flow of the silicon etch gas.