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# United States Patent [19]

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**Grill et al.**

[45] **Date of Patent:** **Nov. 14, 2000**

[54] **HYDROGENATED OXIDIZED SILICON CARBON MATERIAL**

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[21] Appl. No.: **09/107,567**

[22] Filed: **Jun. 29, 1998**

[51] **Int. Cl.**<sup>7</sup> ..... **C23C 16/32**

[52] **U.S. Cl.** ..... **438/780**; 438/781; 438/789;  
427/577; 427/579; 427/249.15; 427/255.37;  
427/255.6

[58] **Field of Search** ..... 427/489, 492,  
427/497, 503, 509, 515, 577, 578, 579,  
249.15, 255.37, 255.6; 438/780, 781, 789

[57] **ABSTRACT**

A low dielectric constant, thermally stable hydrogenated oxidized silicon carbon film which can be used as an interconnect dielectric in IC chips is disclosed. Also disclosed is a method for fabricating a thermally stable hydrogenated oxidized silicon carbon low dielectric constant film utilizing a plasma enhanced chemical vapor deposition technique. Electronic devices containing insulating layers of thermally stable hydrogenated oxidized silicon carbon low dielectric constant materials that are prepared by the method are further disclosed. To enable the fabrication of thermally stable hydrogenated oxidized silicon carbon low dielectric constant film, specific precursor materials having a ring structure are preferred.

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**15 Claims, 4 Drawing Sheets**

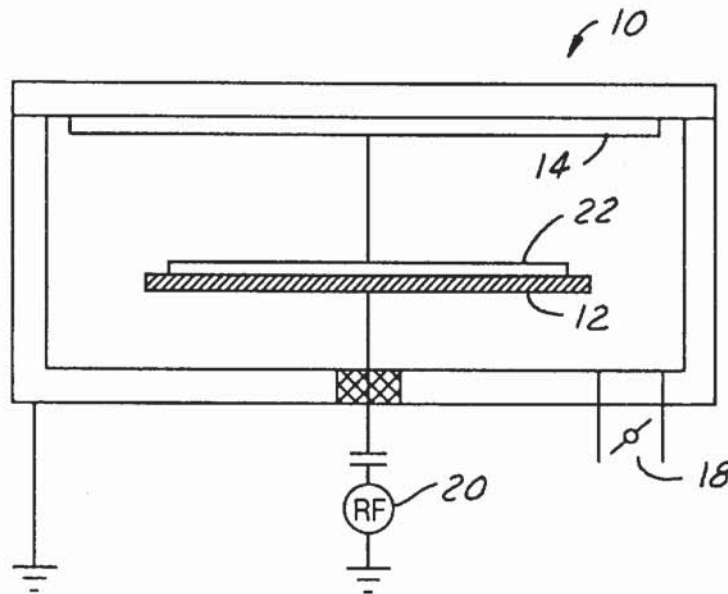


FIG. 1

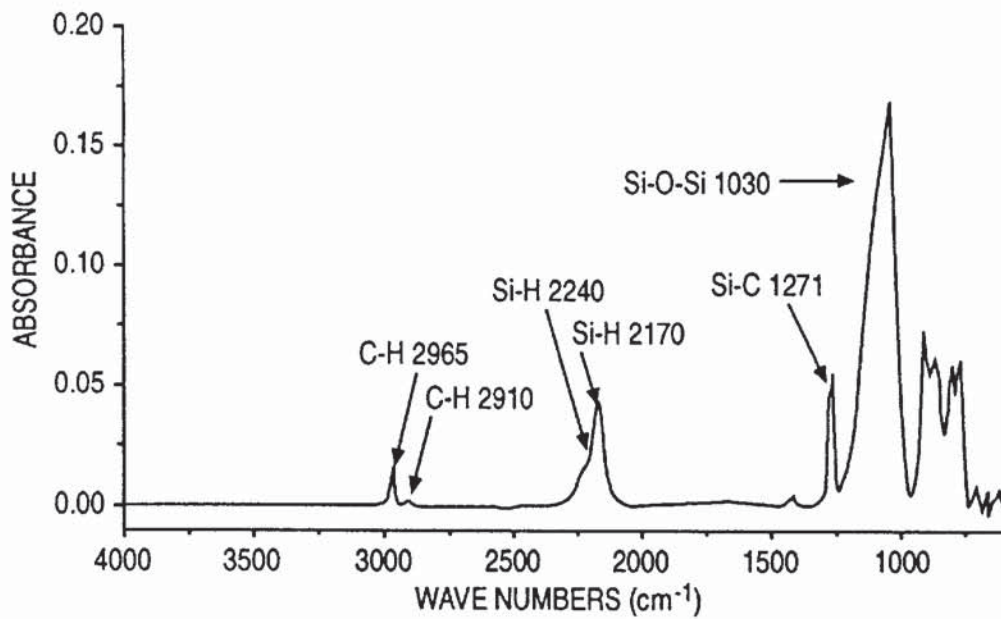


FIG. 2

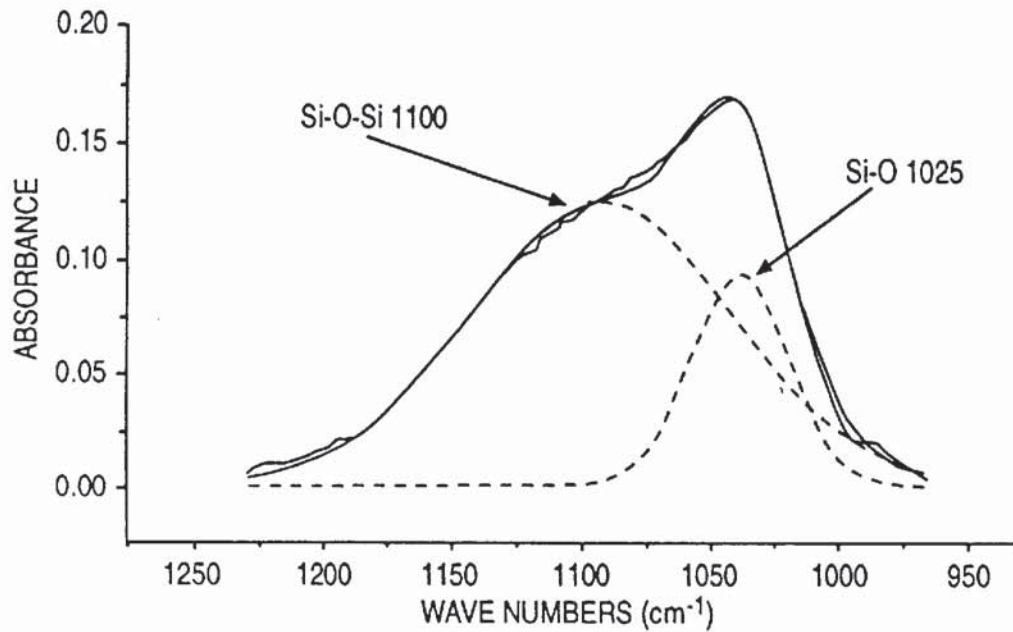


FIG. 3

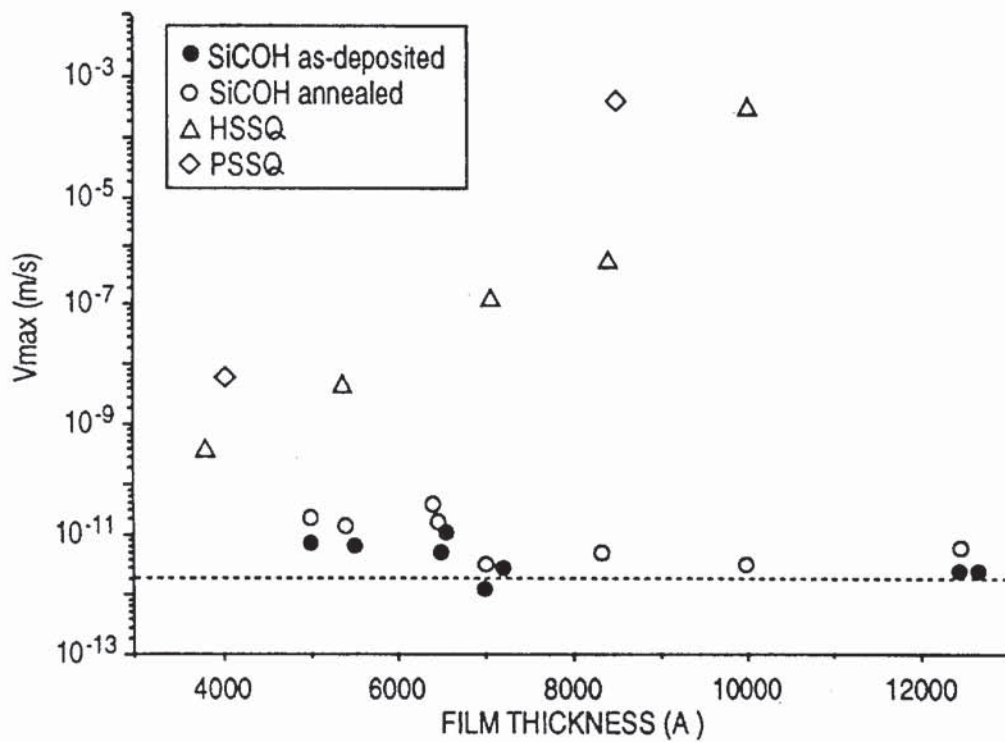


FIG. 4

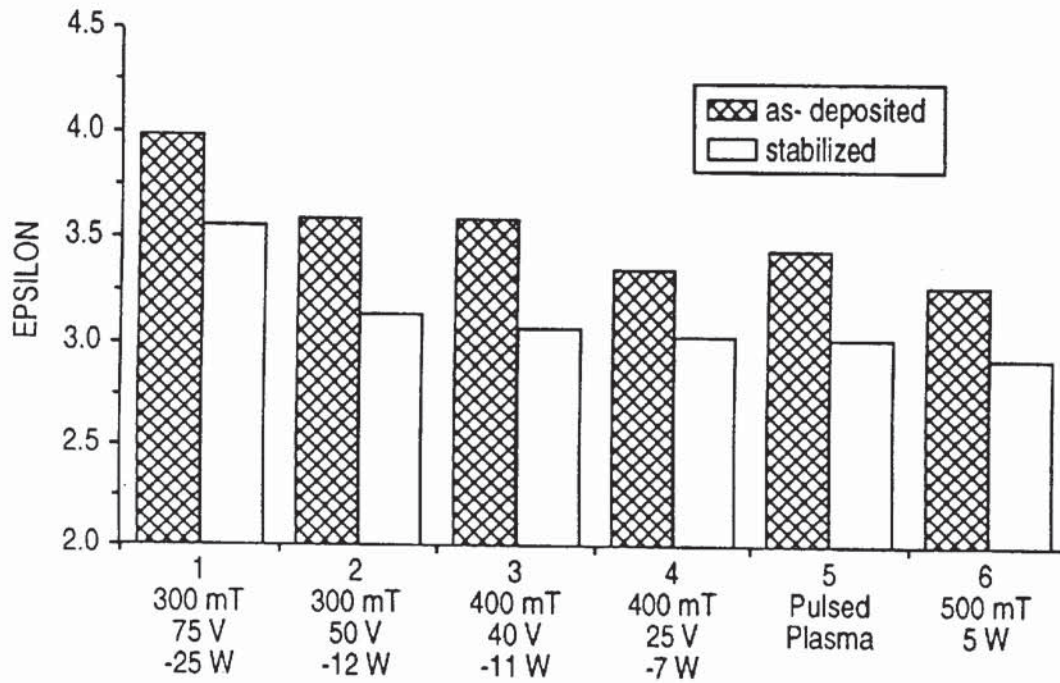


FIG. 5

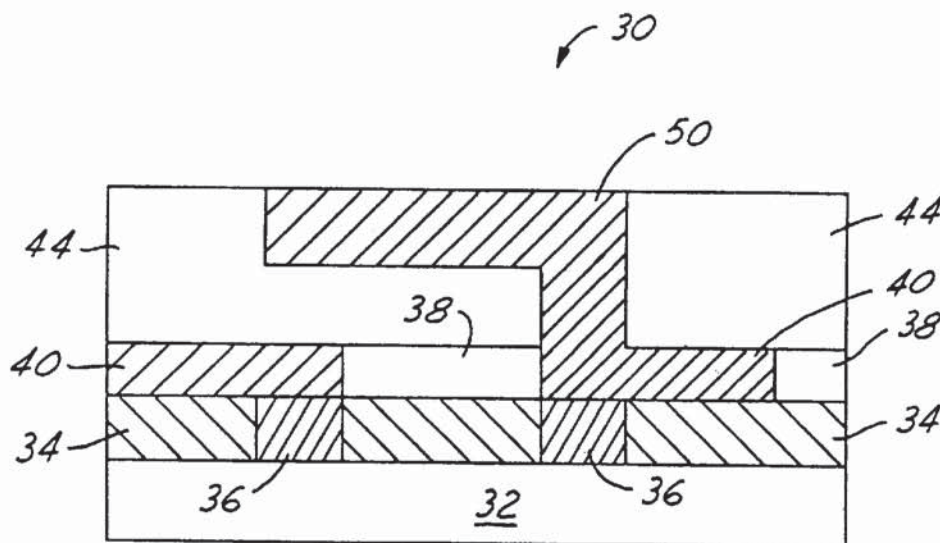


FIG. 6



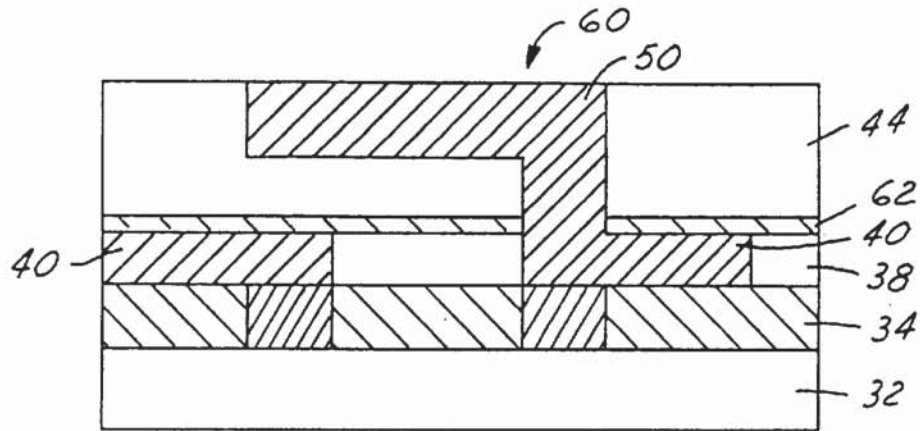


FIG. 7

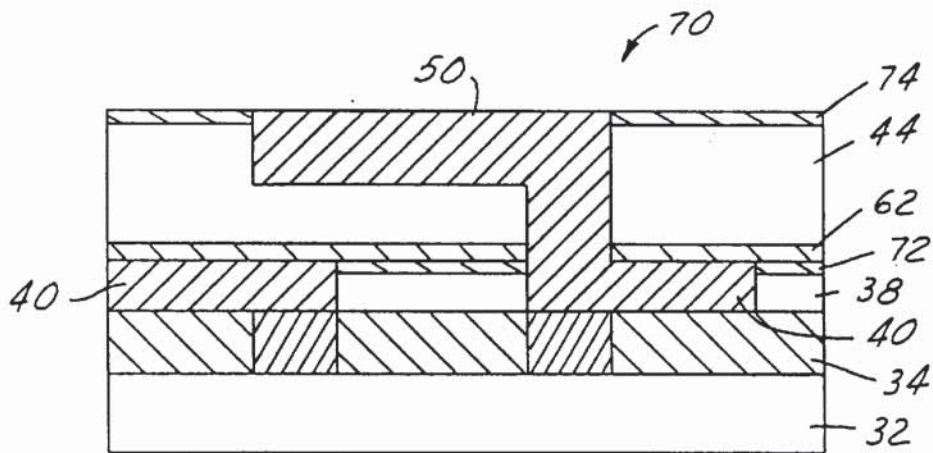


FIG. 8

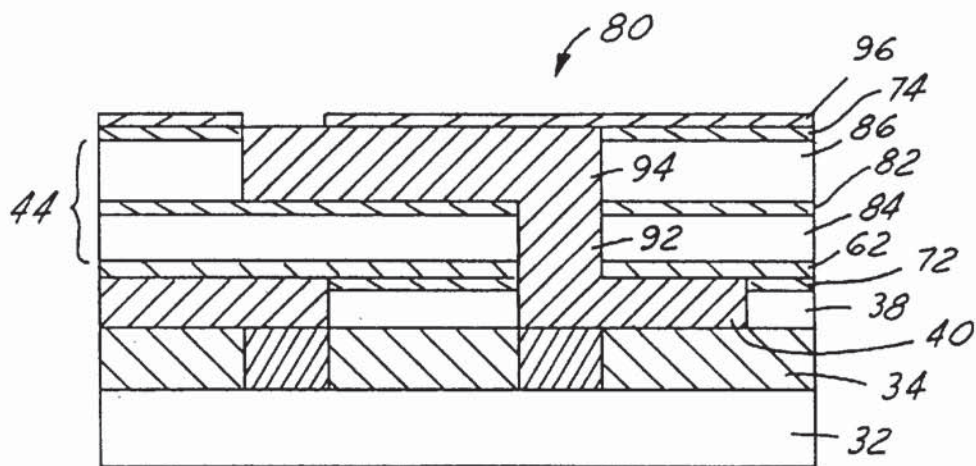


FIG. 9

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