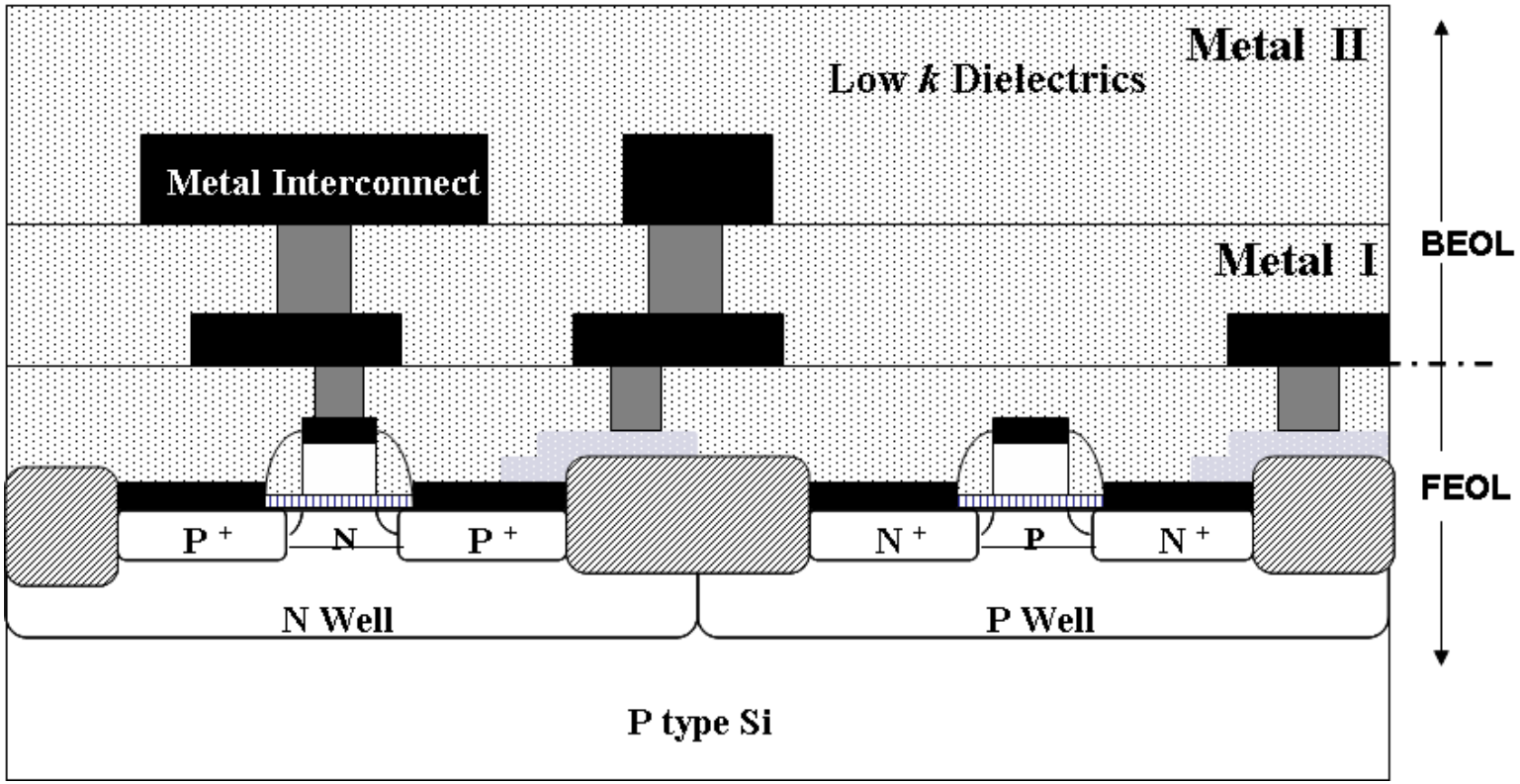


FIGURE 28.1 Cross section of a silicon-integrated circuit with two layers of metal-interconnect.

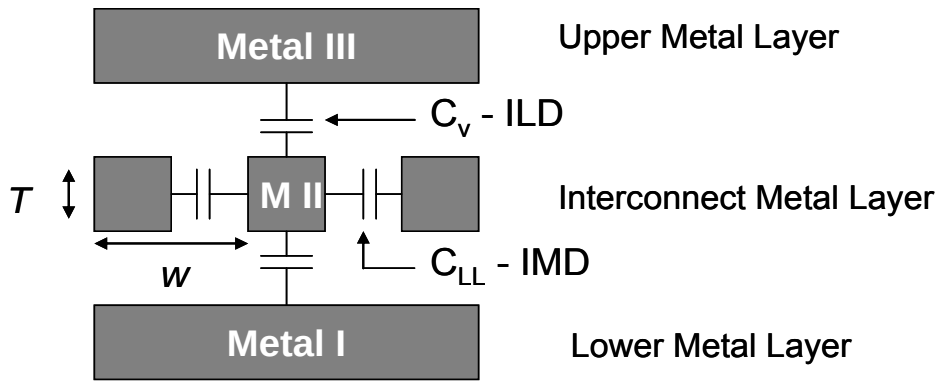


FIGURE 28.2 Capacitance within and between metal layers.

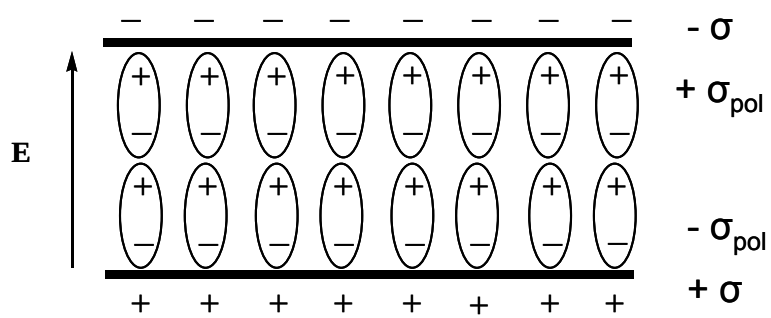


FIGURE 28.3 Schematic cross section of two capacitor plates and a dielectric polarized by an external electricfield, *E*. Each ellipse denotes a dipole moment.

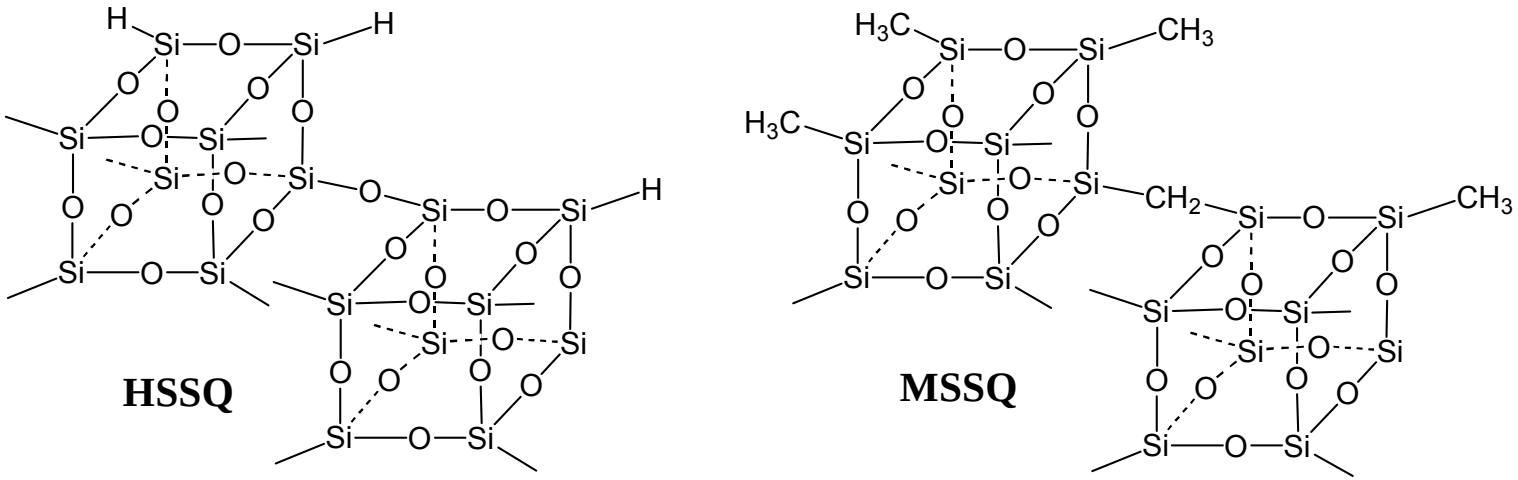


FIGURE 28.4 Structures of hydrogen-SSQ (HSSQ) and methyl-SSQ (MSSQ).

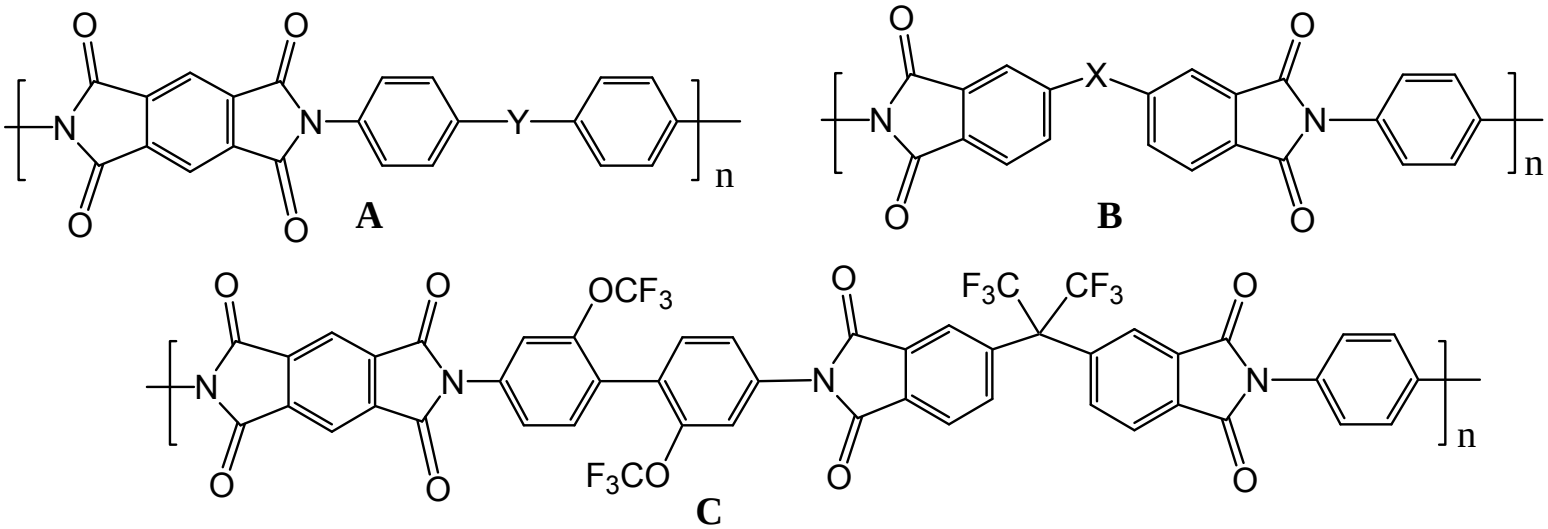


FIGURE 28.5 (a) and (b) Two general structures of aromatic polyimides, and (c) fluorinated polyimide PMDA-TFMOB-FDA-PDA.

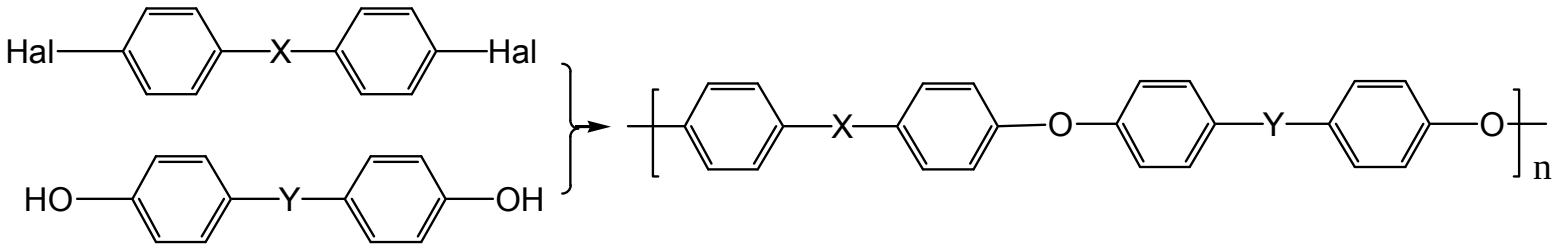


FIGURE 28.6 General synthesis of poly(arylene ethers).

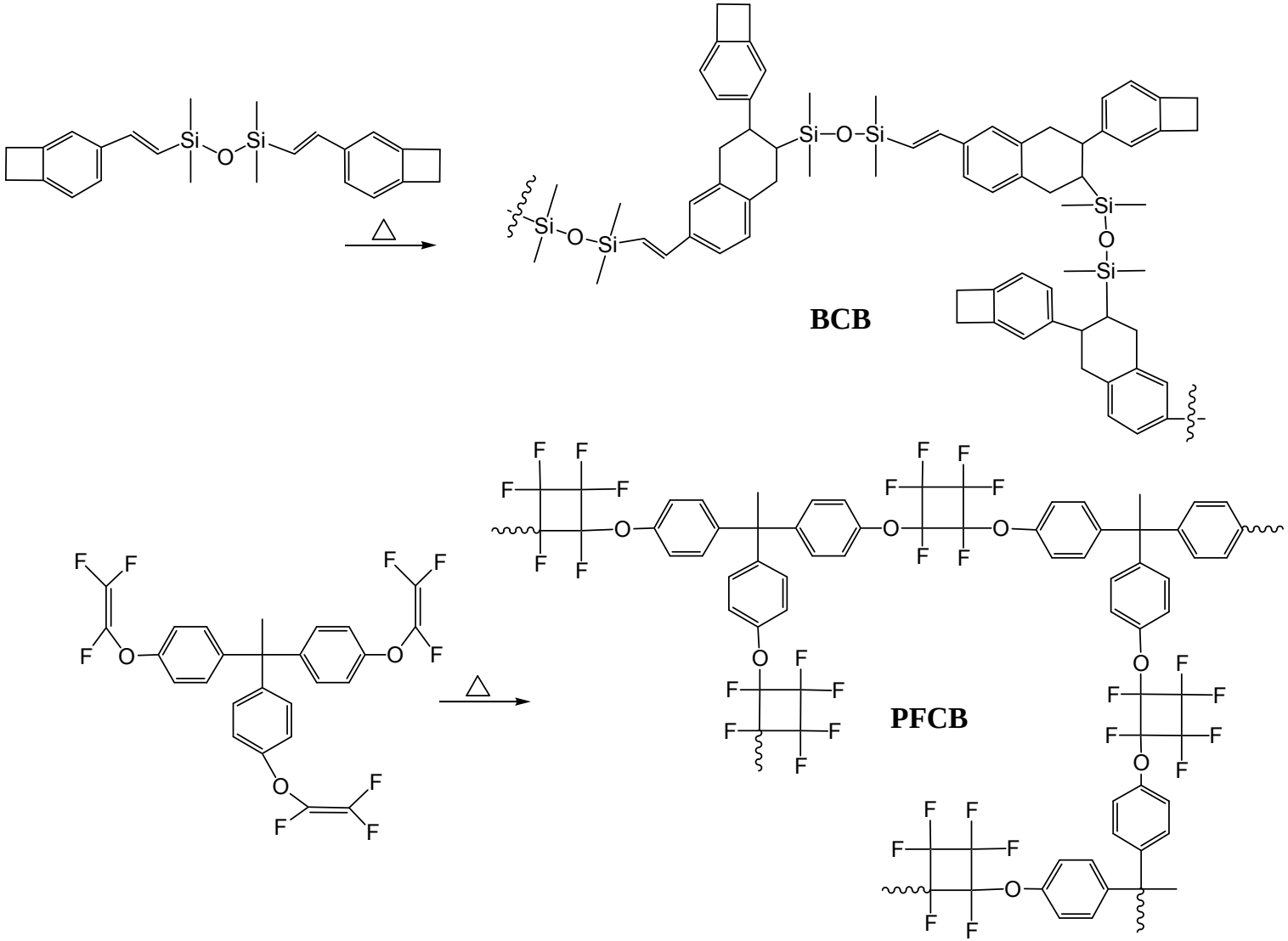


FIGURE 28.7 Divinylsiloxane-based benzocyclobutene (BCB) polymer and poly(perfluorocyclobutene) (PFCB).

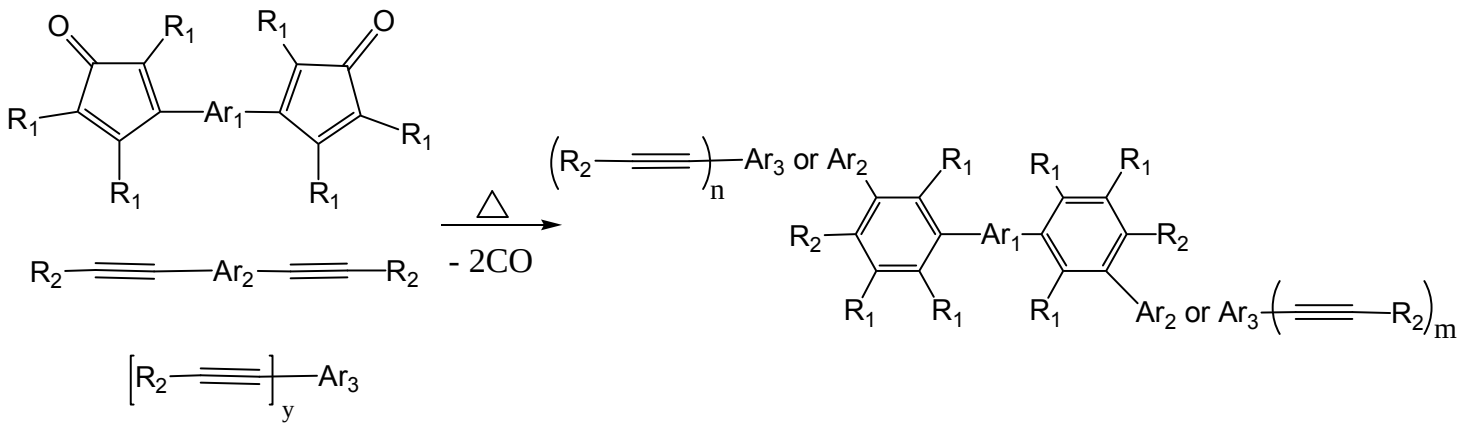


FIGURE 28.8 Synthesis and structure of SiLK.

FIGURE 28.9 Structures of Parylene N (left) and Parylene F (right).

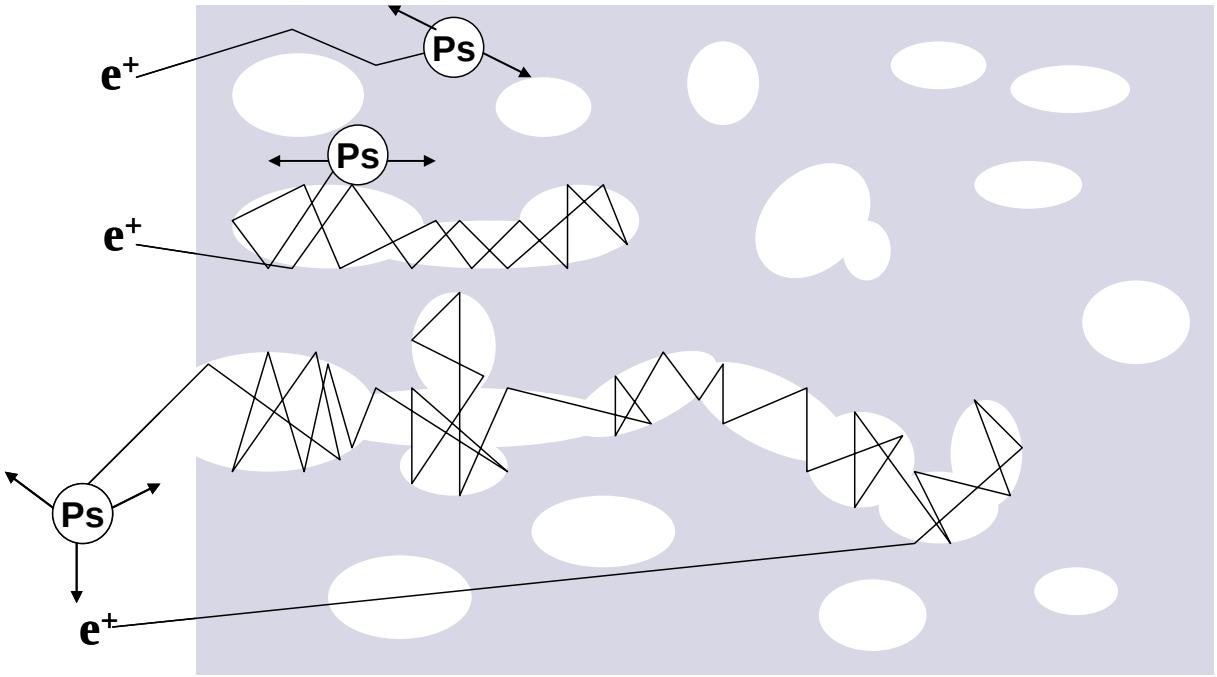


FIGURE 28.10 Formation and diffusion of positronium (Ps) in open and closed porous materials.

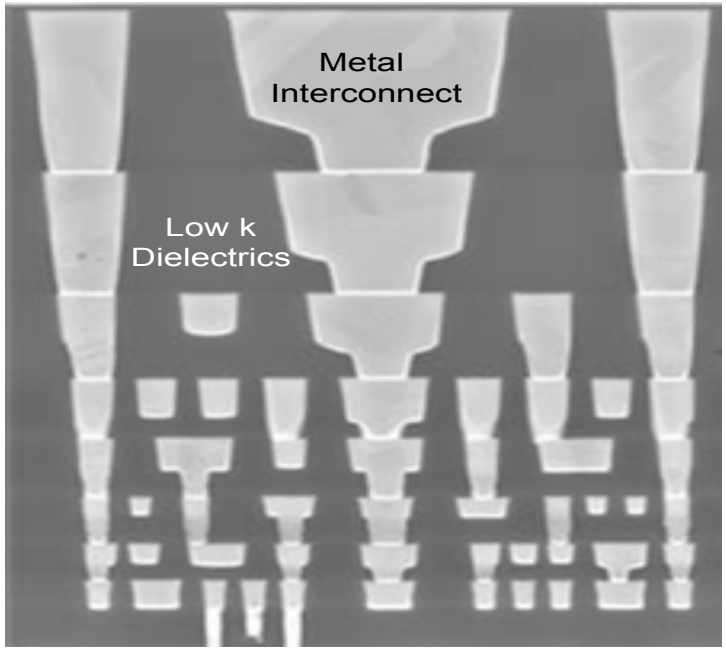


FIGURE 28.11 Interconnect in Intel's 65 nm logic device.

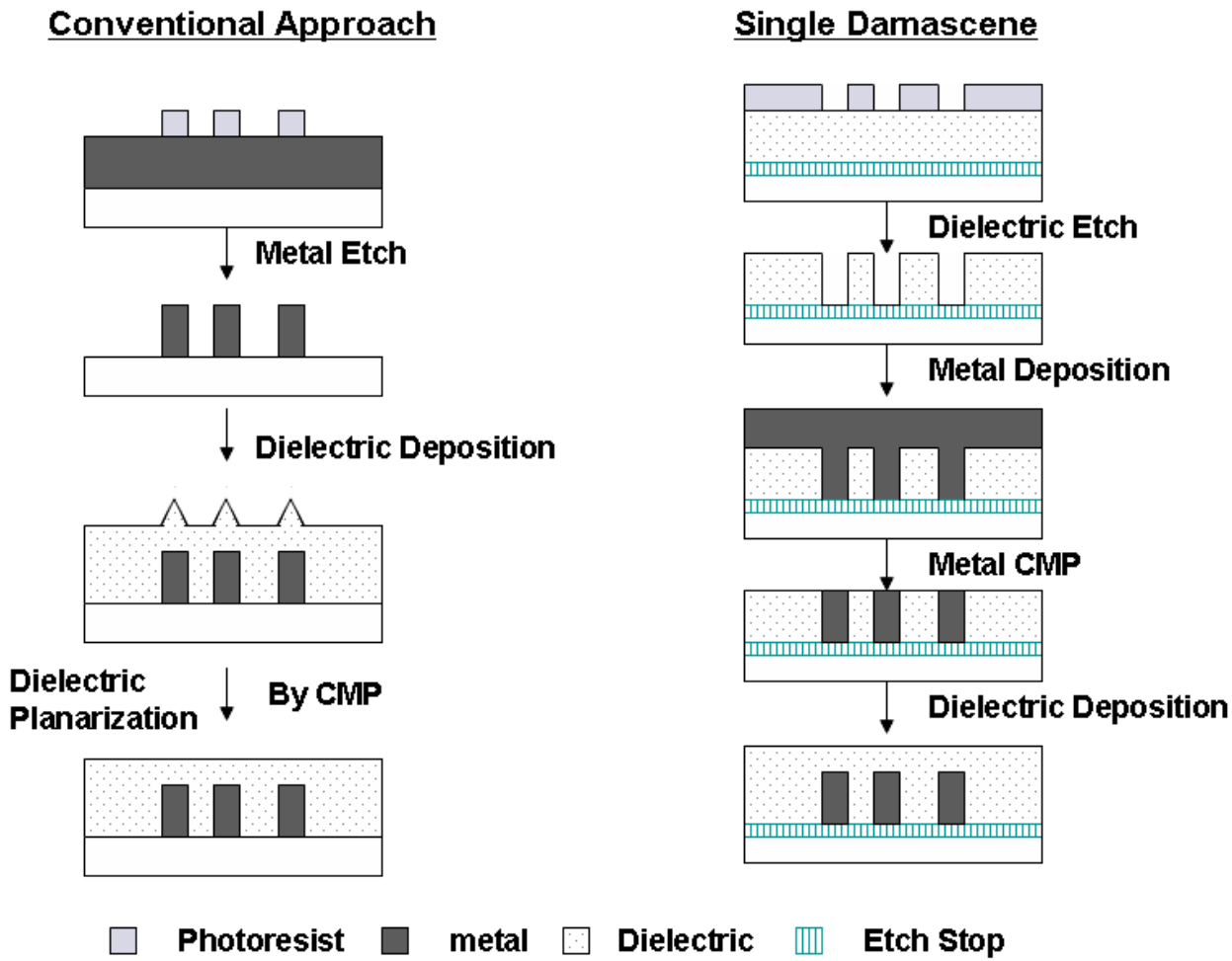


FIGURE 28.12 Conventional and single-damascene interconnect fabrication schemes.

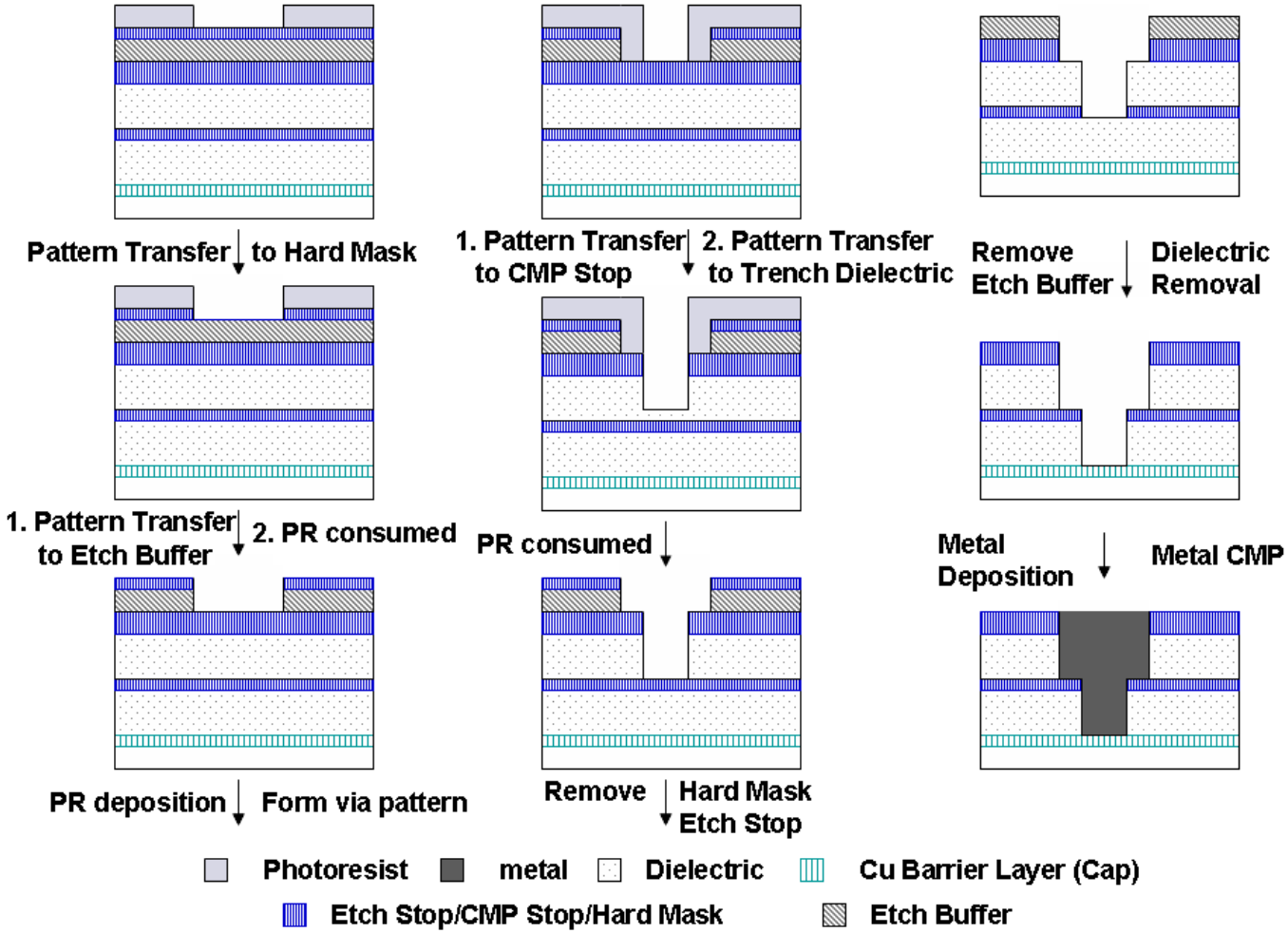


FIGURE 28.13 A representative dual-damascene fabrication scheme of single-layer interconnect.

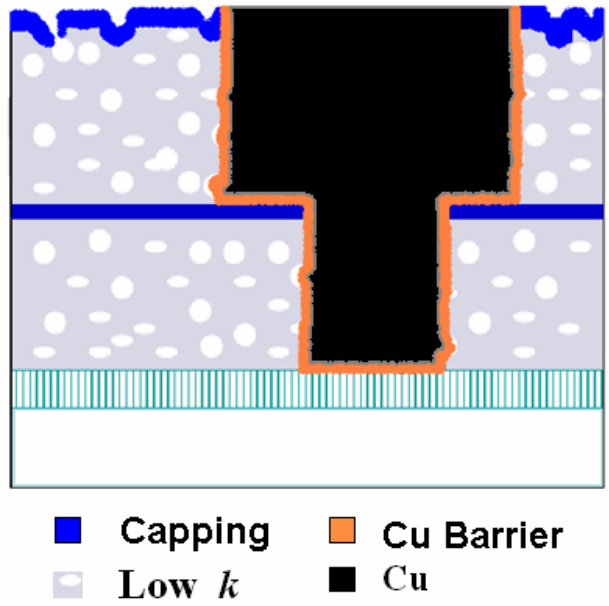
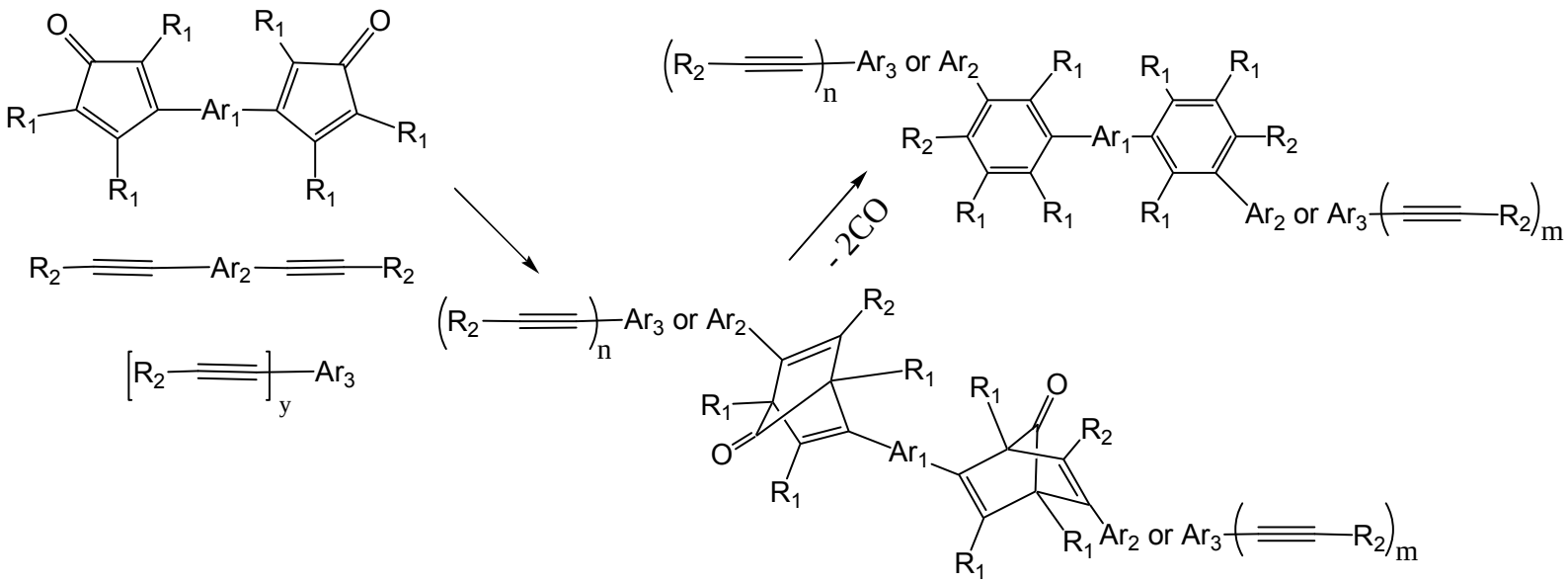
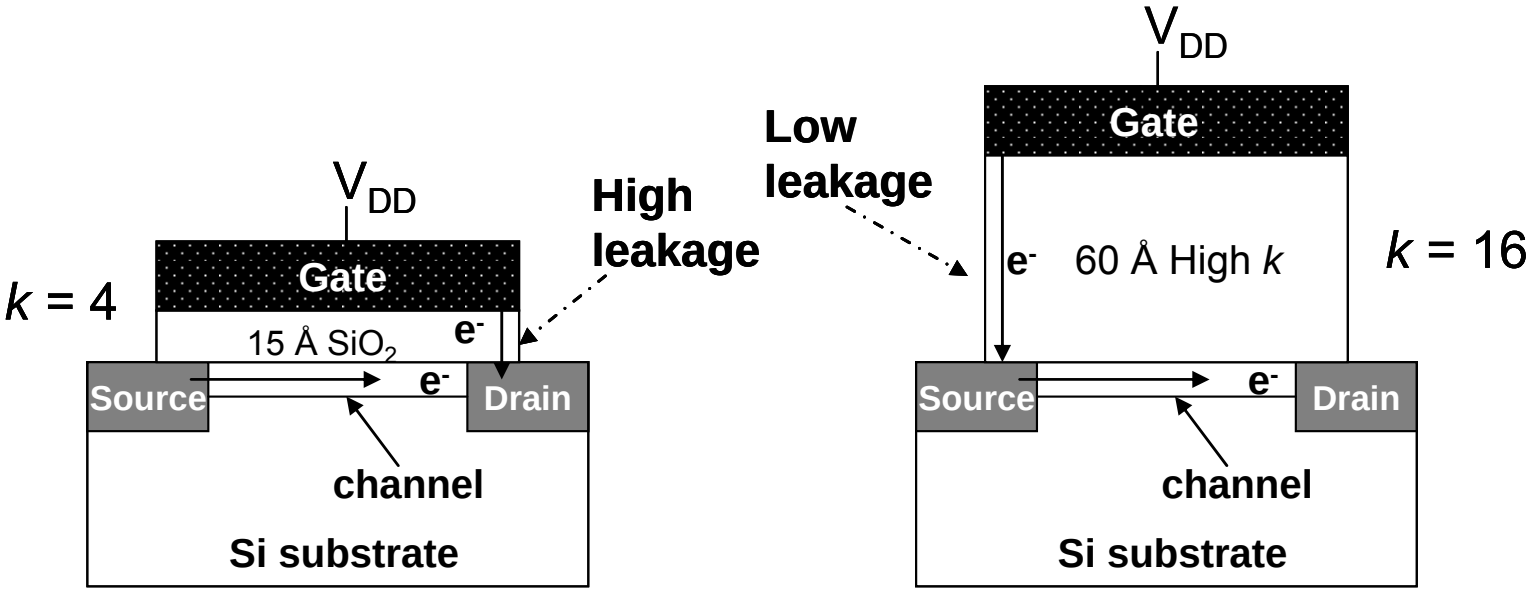


FIGURE 28.14 A schematic of the low-*k* capping layer and the Cu barrier layer.



Chemical structure of the intermediate in SiLK synthesis.



Comparison of a high-*k* dielectric and thermal oxide with same EOT