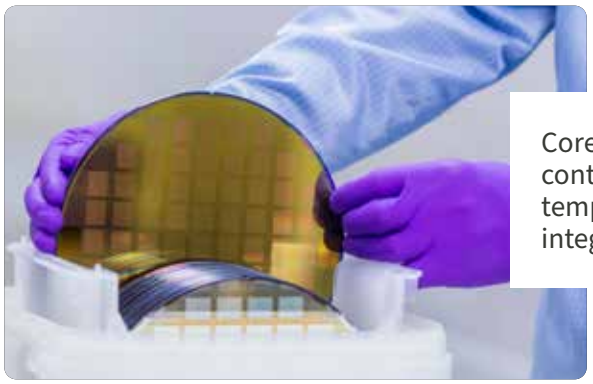
SEMICONDUCTOR APPLICATION™

Coretec Cyclohexasilane



Coretec Cyclohexasilane's (CHS) liquid state and chemical structure contribute to enhanced deposition rates and lower deposition temperatures, especially in microelectronics applications including integrated circuitry, optoelectronics, MEMS, and memory.

Feature	Benefit
More efficient processing	More efficient deposition at lower temperatures and higher rates
Higher purities	Higher performance silicon and silicon-based layers
Long shelf life	Two year shelf life when stored at room temperature
Liquid transport and storage	Lower storage and transportation costs compared to gas
Incorporation into existing processes	CHS can be easily incorporated into existing PECVD/CVD/ALD processes with minor equipment modifications

THE CHALLENGE:

Silane gas (SiH_4) is the most commonly used source of silicon in creating silicon based layers in microelectronics, including SiNx, SiCx, and SiOx. The process yields of silane are not ideal, and often require high depositions temperatures in CVD and ALD processing. As microelectronic features become smaller and smaller, these high processing temperatures can pose disadvantages such as trapped impurities due to poor film growth kinetics and reduced production throughput.

THE POSSIBILITY:

Coretec Cyclohexasilane is a higher order silane (Si_6H_{12} vs SiH_4). This results in significant benefits to deposition temperature, rate, and efficiency with only minor modification to the standard gas delivery system, leading to cost savings and increased production rates. Coretec Cyclohexasilane is a liquid at ambient conditions and can be molecularly doped (B, P). This allows for solution processing of multi-layered devices with the performance of more traditionally fabricated silicon electronic devices and potential for lower cost roll-to-roll processing.

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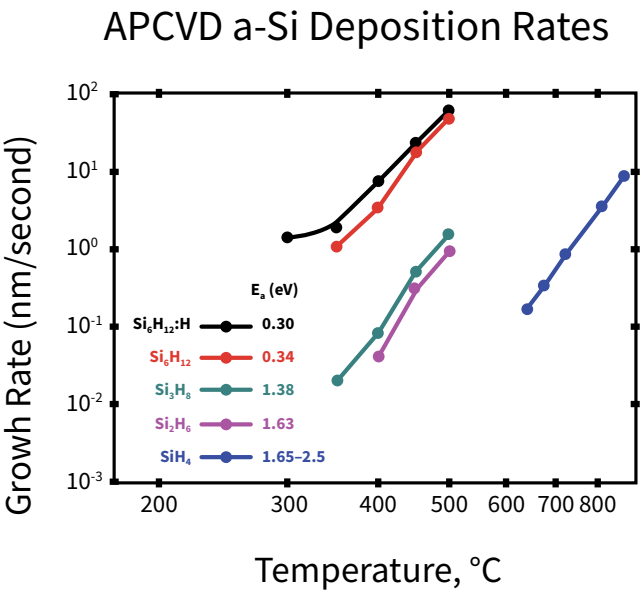
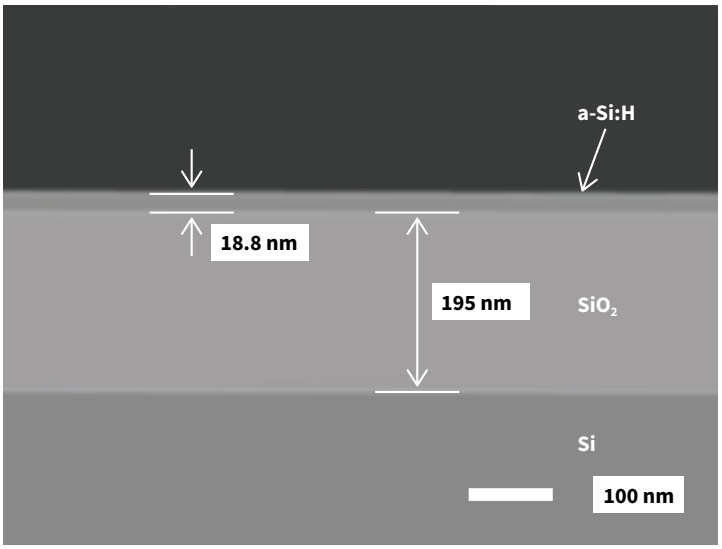
WHAT DOES THIS MEAN?

Example of using cylic versus linear silanes in aerosol assisted chemical vapor deposition (AA-CVD): higher deposition rate, lower deposition temperature, and absence of need for dilution during processing. Thin a-Si:H films are achieved readily from cyclic silane precursors using gas phase or liquid phase spin-coating based techniques.





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