Electronic Application

Coretec HexaSilane™

6x the silicon for superior performance.

Coretec HexaSilane delivers six times the silicon in one molecule, making it an excellent silicon source for electronic applications.

It's liquid state provides the distinct advantage of enabling printable electronics with the performance of more traditional silicon-based microelectronics. As a gas, a distinct advantage is a higher deposition rate at lower temperatures.

Feature	Benefit
• Process as a gas	> More efficient deposition at lower temperatures and higher rates
• Process as a liquid	> Higher performance silicon with emerging printable electronics
• Long shelf life	> Two year shelf life when stored at low temperature
• Liquid storage and transport	> Lower storage and transport costs compared to gas

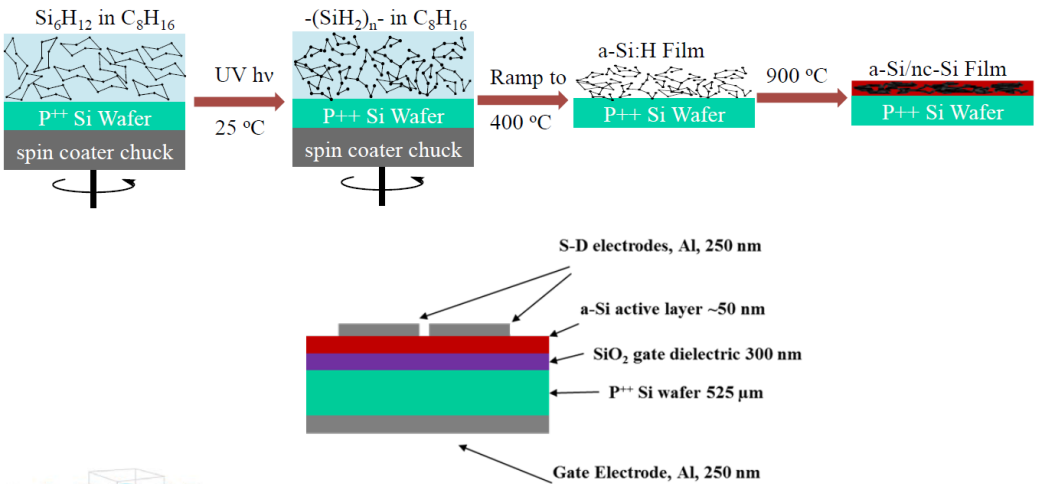
The Challenge

Silicon is the most widely used semiconducting material due to its availability, ease of processing, low environmental impact and low cost. Silicon films are commonly grown by chemical vapor deposition at high temperatures and low pressures. By integrating chemical vapor deposition with plasma, lower processing temperatures can be used, but at a cost to processing rate and efficiency. Alternatively, organic semiconductors can be solution processed at ambient conditions, but lack the performance often required for many electronic applications.

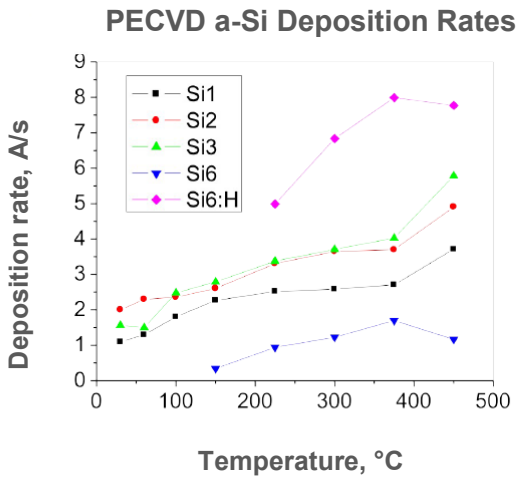
The Possibility

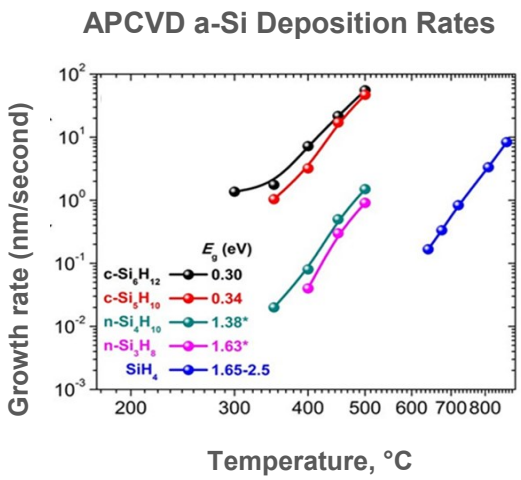
Coretec HexaSilane is a higher order silane (Si_6H_{12} vs SiH_4). This results in significant benefits to deposition temperature, rate, and efficiency with only minor modification to the standard gas delivery system, leading to cost savings and increased production rates. *Coretec HexaSilane* is a liquid at ambient conditions and can be doped at a molecular level (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.

Example of incorporating a solution processed silicon thin film in a bottom-gate thin film transistor



Example of using HexaSilane™ as a plasma enhanced (PE) and aerosol assisted (AP) chemical vapor deposition (CVD) precursor: higher deposition rate, lower deposition temperature, and absence of need for dilution during processing





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