Materials & Chemicals

Organoelement Resists for EUV Lithography

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing organoelement resist materials that are robust to processing with both UV and EUV.

Overview

Extreme ultraviolet (EUV) lithography is one of the most promising techniques for creating semiconductor devices, integrated circuits and microelectronic devices with nanoscale features (i.e., smaller than 50 nm). But the number of materials, especially resist materials, that can withstand processing with EUV is currently quite limited. Today's resist materials also contain large numbers of oxygen and fluorine atoms, which tend to absorb high levels of electromagnetic radiation and thus may not be suitable for processing with EUV.

The Invention

UW-Madison researchers have developed organoelement resist materials that are robust to processing with both UV and EUV. Unlike current resist materials, these materials contain an oxygen and fluorine content of 14 percent or less, and are primarily composed of low-absorbing elements, such as hydrogen, carbon, silicon and boron. The incorporation of silicon- and boron-containing polymers into a resist material can reduce ion reactive etch rates and improve transmission characteristics, both of which are needed during EUV lithography. The invention also includes methods for synthesizing silicon- and boron-containing materials for use in resist compositions.

Applications

- EUV lithography for the creation of semiconductor devices, integrated circuits and microelectronic devices

Key Benefits

- Resists are robust to processing with both UV and EUV.
- Allow the creation of nanoscale devices with features smaller than 50 nm
- Resists show oxygen reactive ion etch rates that are much lower than those of Novolac resists under the same conditions

Tech Fields

- Materials & Chemicals : Polymers
- Semiconductors & Integrated Circuits : Lithography

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842