

Organic Clustures(MOCS) resist formulation Compatible to next Generation Lithogaphy applications for high volume electrronics chip manufacturing

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ABSTRACT

Present invention describes the synthesis of novel organo-inorganic based metal-organic cluster (MOCs) resist to achieve sub-15 nm technology node in semiconductor industries. Said resists are synthesized by reacting Indium (III) Acetate and MAA ligand. The synthesized metal-organic cluster formulation demonstrates a narrow size distribution of ~ 2 nm or less. The developed resists are further modified with the incorporation of photoacid generators (PAGs) to enhance the post-exposure dissolution rate into specifically optimized developer solution to produce well-resolved and scum-free sub-15 nm HP line patterns. The designed resists are highly sensitive and able to pattern various features in micro to nano-domain by advanced lithography techniques such as helium ion beam lithography, e-beam lithography, 254 nm DUVL and 13.5 nm EUVL for high-resolution patterning.

KEY APPLICATION AREAS

- 1.Semiconductor chip manufacturing.
- 2.Next-generation lithography (EUV, E-beam, He-ion, DUV).
- 3.Nano-patterning and photolithography.
- 4.CMOS, FET, and FinFET fabrication.
- 5.MEMS/BioMEMS and sensor devices.
- 6.Microelectronics and nanotechnology.

POTENTIAL USES

- 1.High-resolution photoresists for sub-15 nm patterning.
- 2.Fabrication of advanced integrated circuits (ICs).
- 3.Dense nano-patterned mask manufacturing.
- 4.Pattern transfer with high etch resistance.
- 5.Manufacturing of next-generation semiconductor devices.
- 6.High-volume electronics chip production.