Advanced Tools & Infrastructure for R&D and Prescreening of EUV Resists and related Design and Fab of Electronic Devices at Indian Institute of Technology (IIT) Mandi, India

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Since EUV photons are still scarce and expensive, protocols based on readily available Electron Beam Lithography (EBL), Helium Ion Beam Lithography (HIBL) tools and FESEM/AFM for metrology have been developed in-house for screening resists for sensitivity, CD, LER/LWR, etch. A cost and time effective prelude to successful EUV patterning. One of the key metrics for EUV resist is the sensitivity towards EUV radiation. However, it is observed that the exposure energy within the resist film is mainly responsible for the chemistry. This applies to both high KeV electrons, He^{+} ions and EUV photons. Thus EBL (and more recently HIBL) have been demonstrated as rapid inexpensive approximating experimental tools for simulating EUVL for resists prescreening.

State-of-the-art clean synthesis labs, materials characterization facilities at [a]**Advanced Materials Research Center** (AMRC), class 100 clean room at [b]**Center for Design and Fabrication of Electronic Devices** (C4DFED) with all relevant major tools EBL, HIBL, FESEM, AFM, Ellipsometry, RIE are available onsite. Industrial outreach for R&D for rapidly screening potential resists for EUV based on *ab initio* synthesis or modifications thereof are possible due to in-house synthesis labs and extensive materials characterization tools ranging from NMR/IR/XPS/HRTEM/XRD to MWD by GPC/DLS, separation chromatography, thermal analysis amongst others. Device design and fab are also the expertise of C4DFED professional staff and engineers along with with device testing leading to implementation. In addition to EUV, resists for industrial DUV/MUV/EBL/HIBL have also been successful. Highly trained experienced personnel, organic/inorganic chemists, physicists and engineers are available for various projects related to the above objectives.

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