

Abstract Submitted
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Poly (2-vinyl naphthalene-b-acrylic acid) (P2VN-b-PAA) block copolymer pattern formation, alignment and pattern transfer by reactive ion etching (RIE) XIN ZHANG, CHRISTOPHER METTING, R.M. BRIBER, SANG HAK SHIN, BEN JONES, Department of Materials Science and Engineering, University of Maryland, College Park, MD 20742 — P2VN-b-PAA ($M_n=30.8$ -b-24 kDa) lamellar block copolymer was examined for use as a pattern transfer template due to the potential large dry etching contrast between the blocks. As-spun films have a micelle or vertically oriented cylindrical morphology depending on the spinning solvent. Vapor annealing with acetone, a poor solvent for P2VN-b-PAA, resulted rapid reordering to a vertically oriented lamellar morphology within 5 minutes for films <50 nm thick. Films between 30 to 50 nm thick were spin coated onto oxide wafers with interdigitated electrodes to examine if an electric field would align the morphology. The lamellae aligned normal to the electrodes within 1 hour by electric field assisted acetone vapor annealing at field strengths as low as 1V/micron. CF_4 plasma dry etching contrast as high as 1:3.8 (P2VN:PAA) for homopolymer blanket films was measured. The block copolymer pattern was transferred to the silicon substrate in two steps using CF_4 followed by SF_6 RIE.

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