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Manipulating the Crystal Growth of Organic Energetic Materials on Substrates XIN ZHANG, GENGXIN ZHANG, BRANDON WEEKS, Texas Tech University — Organic energetic materials (OMEs) have been attracted a lot of attention due to its wide application in military weapon. One of the most compelling researches is manipulating the crystal structure of OEMs due to their performances, such as ignition and burning rate, which depend strongly on the crystalline structure. The crystalline structure of OEMs on substrates has strong dependence on the experimental parameters, such as the deposition rate and external factors. This report demonstrates a new technique for manipulating the crystal growth of OEMs on substrates by micro-contact printing. The methodology depends on coating a polymer stamp with a surfactant, which has a strong affinity for the OEMs deposited on the substrate. The coated stamp selectively removes OEMs in contact areas when the stamp was lifted. And then the OEMs that were left on the substrates grew to the crystals. By careful choice facile film preparation method and optimal stamp pattern, this technique provides a new methodology for fabricating OEMs crystals from hexagon single crystals, dendrite crystals to micro-rod crystals and manipulating the size and distribution of these crystals.

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