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The twist-bend nematic phase of bent mesogenic dimers and its mixtures¹ MICHAEL TUCHBAND, MIN SHUAI, KERI GRABER, DONG CHEN, LEO RADZIHOVSKY, ARTHUR KLITNICK, Department of Physics, University of Colorado Boulder, LEE FOLEY, ALYSSA SCARBROUGH, JAN PORADA, MARK MORAN, EVA KORBLOVA, DAVID WALBA, Department of Chemistry, University of Colorado Boulder, MATTHEW GLASER, JOESPH MACLENNAN, NOEL CLARK, Department of Physics, University of Colorado Boulder, SOFT MATERIALS RESEARCH CENTER TEAM — Binary mixtures of the twist-bend nematic-forming liquid crystal CB7CB with the prototypical rod-like liquid crystal 5CB exhibit a twist-bend nematic phase with properties similar to those reported for neat CB7CB. The linear dependence of the phase transition temperature on concentration indicates that these binary mixtures are nearly ideal. We confirm the presence of nanoscale modulations of the molecular orientation in the mixtures by freeze-fracture transmission electron microscopy (FFTEM). We devise and implement a statistical approach to quantitatively measure the ground state pitch of the twist-bend phase and its mixtures using FFTEM. The addition of 5CB generally shifts the measured ground-state pitch distributions towards larger pitch. The pitch apparently increases discontinuously at higher 5CB concentrations.

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