Supplementary Materials: Electronic and transport properties of two-dimensional conjugated polymer networks including disorder.

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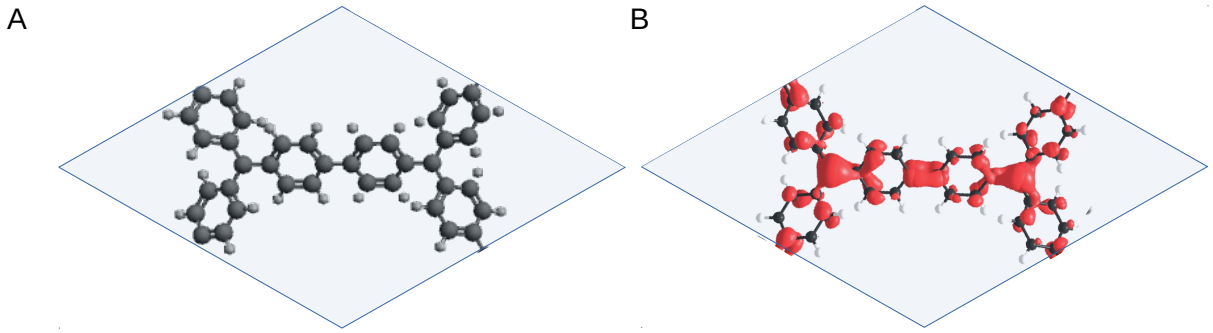

Figure 1: (A) A pristine 2DCP cell and (B) the corresponding wave function at the highest occupied state (at K-point).

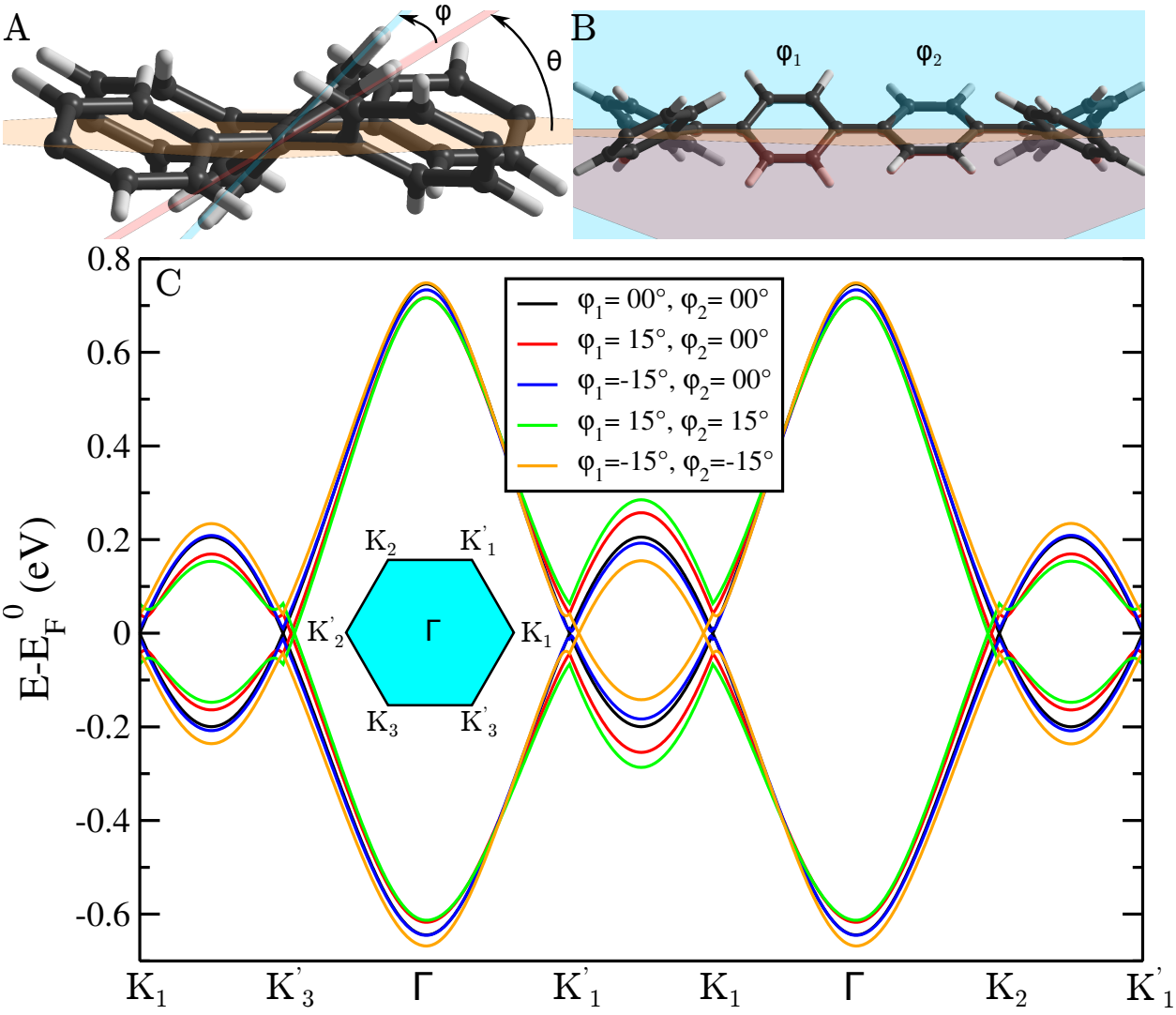

Figure 2: Effect of various benzene rotations on the electronic properties of the 2D conjugated polymer network. (A) Side view along a branch axis of the primitive cell, θ represents the dihedral angle between a branch and the XY plan. φ represents the dihedral angle between benzene rings and θ. (B) Side view perpendicular to the branch axis in (A). φ_1 represents the dihedral angle of the first benzene ring and φ_2 represents the dihedral angle of the second benzene ring with respect to θ. (C) First-principles electronic band structures for structures with different rotational angles. The black curve is the ground state band structure (θ=30.8° and φ_1=φ_2=0°), the red and blue curves are the band structures with a single benzene ring rotated by +15° (φ_1=15°, φ_2=0°) and -15° (φ_1=-15°, φ_2=0°) respectively. The green and orange curves are the band structures with a branch rotated by +15° (φ_1=φ_2=15°) and -15° (φ_1=φ_2=-15°).

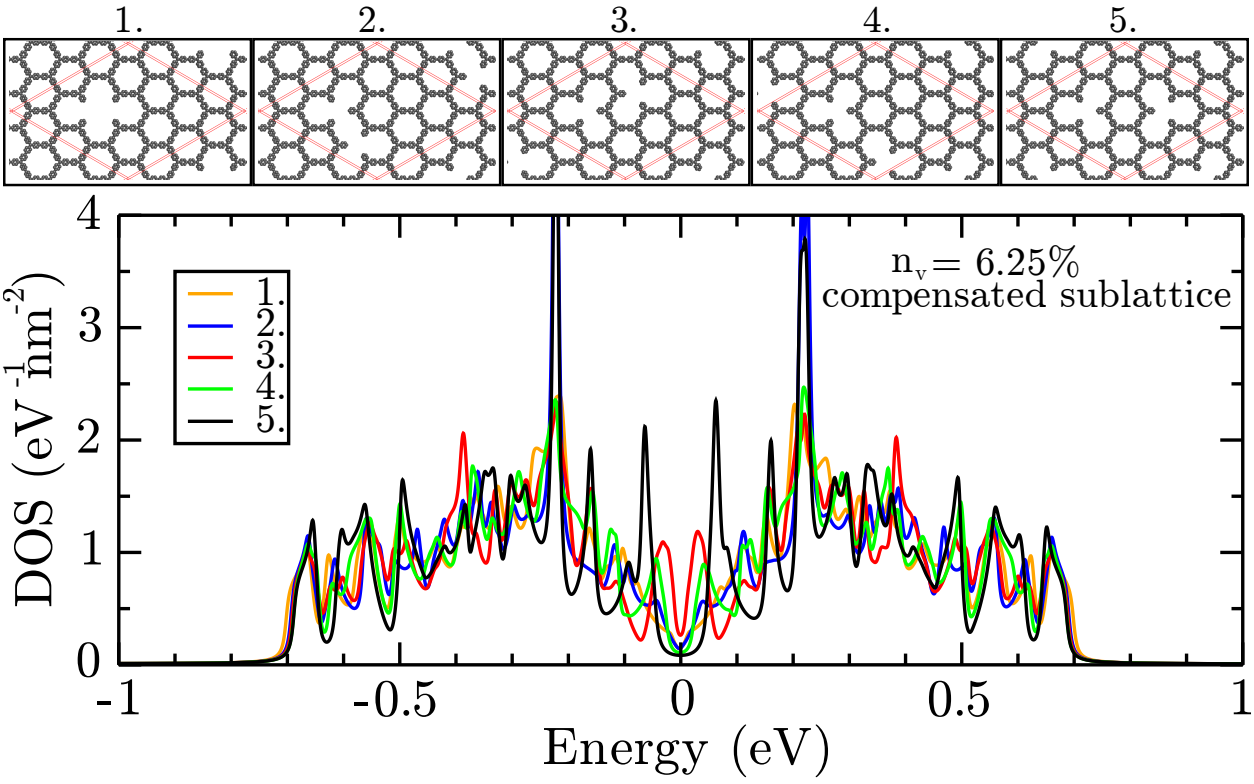

Figure 3: A 4x4 2DCP cell containing 6.25% of vacancies. For each structure, from 1 to 5, there are two vacancies: one located on the sub-lattice "A" and one on the sub-lattice "B". These five different configurations are investigated and their respective DOS are shown.