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Minimal energy configurations in isostatic networks MAHDI SADJADI, M. F. THORPE, Arizona State University — We present results of energy minimization in two-dimensional (2D) network of corner sharing triangles. These isostatic networks are important in modelling of bilayers of vitreous silica (SiO_2) where upper and lower layers consist of tetrahedra joined at the apex. In the 2D monolayer, triangles are formed with the O atoms at the vertices, while Si atoms (after projecting onto the plane) are placed at the center of each triangle. The isostatic nature of the experimental samples requires a careful choice of boundary conditions as the surface effect is not negligible, even for large samples. We employ anchored boundary conditions, where half of the atoms at the surface are pinned, to relax the structure using harmonic potential to produce corner sharing networks with perfect equilateral triangles. We show that the network exhibits two distinct flexibility windows at different ranges of density. The window at lower density shows physically acceptable realizations of the network while the window at higher density corresponds to unphysical case where triangles are overlapping.

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