On saturated bi-layered disk shaped tetrahedral packings

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Abstract: Recently, a wide range of living tissues which are relatively planar have been extensively studied experimentally. A process for synthesizing silicate/mordenite membranes with disc shape was experimentally successful. We describe saturated triangle packings in the plane realized by equilateral non-overlapping triangles which are infinitesimally rigid as well as generically globally rigid in the plane. Moreover, they are extendable to saturated bilayer tetrahedral packings which are disc shaped and essentially planar. They are generically rigid in 3-space, but have an auxetic motion in their unit-distance realization.