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## Description of Additional Supplementary Files

**Supplementary Movie 1.** A classical molecular dynamics trajectory of the formation of the monolayer NaCl nanocrystals within monolayer water.

**Supplementary Movie 2.** A classical molecular dynamics trajectory of the formation of the monolayer LiCl domains within monolayer water.

**Supplementary Movie 3.** An *ab initio* molecular dynamics trajectory of an NaCl square nanostructure within the monolayer water confined between two graphene walls.

**Supplementary Movie 4.** An *ab initio* molecular dynamics trajectory of the spontaneous transformation of an NaCl domain from the hexagonal ring to a square nanostructure within the monolayer water confined between two graphene walls.

**Supplementary Movie 5.** An *ab initio* molecular dynamics trajectory of an LiCl hexagonal ring within the monolayer water confined between two graphene walls.

**Supplementary Movie 6.** An *ab initio* molecular dynamics trajectory of the spontaneous transformation of an LiCl domain from a square structure into a zigzag chain structure within the monolayer water confined between two graphene walls