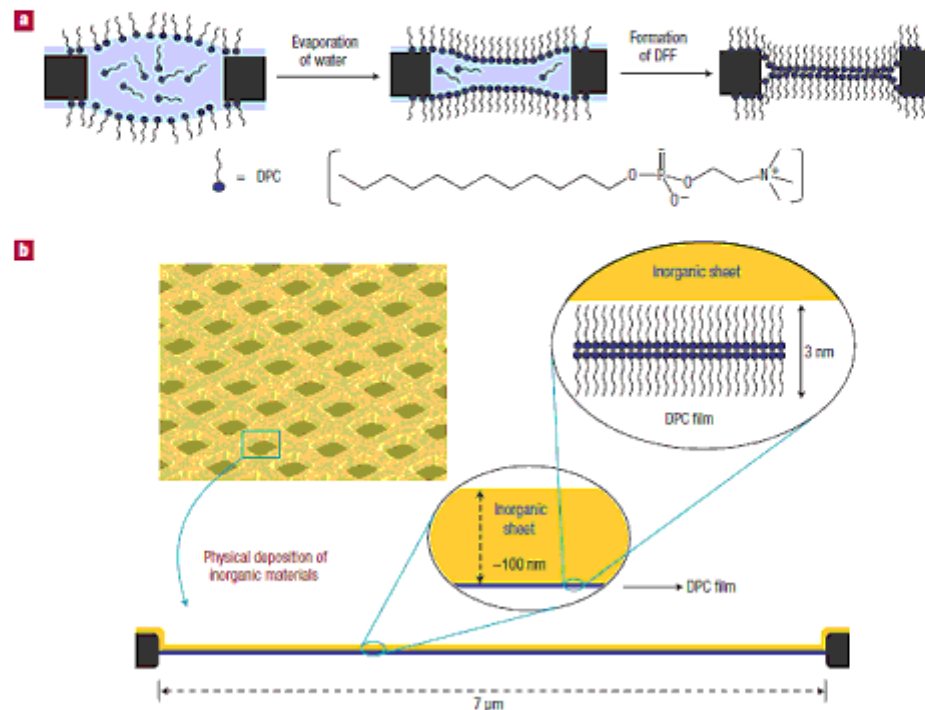


Surfactant-Assisted Fabrication of Free-Standing Inorganic Sheets

Thin inorganic membranes are of importance to a number of applications such as sensing, catalysis and separation. This work provides a novel method to fabricate free-standing sheets of various inorganic materials (C, Si, CdSe, etc.) with a thickness of a few to hundred nanometers. First, an array of the holes in a flat substrate was uniformly covered by dried foam films (DFFs), self-standing reversed bilayers of surfactants. Then inorganic materials were deposited on DFFs by means of various physical deposition techniques such as sputtering, electron beam deposition, and thermal deposition. The surfactant bilayers were robust for some inorganic materials of amorphous nature. The resultant thin inorganic layers showed improved thermal stability compared with the DFFs. This fabrication method provides a flexible and reliable way to readily produce free-standing inorganic films and multilayer films.



Schematic illustration of preparation process of free-standing inorganic sheets