The Marangoni effect describes how fluid flows in response to gradients in surface energy. We recently developed a method for photochemically preprograming spatial surface energy patterns in glassy polystyrene (PS) thin films. UV irradiation through a mask selectively dehydrogenates the PS, thus increasing surface energy in the UV exposed regions compared to the unexposed regions. After heating the film to the liquid state, transport of polymer occurs from regions of low surface energy to regions of high surface energy. This method can be harnessed to rapidly manufacture polymer films possessing prescribed three-dimensional topographies reflective of the original light exposure pattern without solvent washes or etching procedures. To better understand this phenomenon, a theoretical model will be presented that reveals the physics of this process, its limits and ways to apply it efficiently for various target metrics.