Two-dimensional (2D) materials, such as graphene and MoS2 have been attracting wide interest for their high surface-to-mass ratio and unique physical and chemical properties. These kinds of materials are considered 2D because they represent the thinnest unsupported crystalline solids that can be realized; they possess a combination of large, tunable electronic bandgaps, optical transparency, and mechanical flexibility. In this work experiments were carried out to examine pulsed laser annealing of ultra-thin films of MoS2 on flexible substrates (PDMS) with 4 different modulus values of elasticity. Raman spectrometry was used to characterize the degree of crystallization before and after laser annealing. These materials are of interest to the healthcare industry for applications involving ultra-sensitive and ultra-selective vapor or liquid phase detection. Despite the promise these materials show, development of sensors has been slow due to challenges associated with large-scale synthesis of 2D materials. Laser annealing of amorphous TMD films is one avenue towards large area applications that is particularly useful for flexible substrates. The technique has only recently been demonstrated, so any scientific results in this area are novel and eagerly anticipated by flexible electronics community. As a result, existing flexible technology can enable the long sought after large-area high-performance flexible devices that can be manufactured at economically viable scales.

Keywords: MoS2, films, annealing

Presenting author's email: argeliapp@ciencias.unam.mx