Direct Observation of Langmuir Films of Fullerenes Using Brewster Angle Microscopy

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The aim of this paper is to present a direct observation of Langmuir films made of C_{60} and C_{70} along the process of their compression at 298 K, using Brewster angle microscopy. We found coexisting a gas phase and a condensed phase at low area densities. Our results agree with the formation of multilayers even at low area densities (500-1000 Å^2/molec.). We made compressions of the films at several speeds. Using dilute spreading solutions (~1 x 10^{-5} M) and slow compressions we obtained multilayers. With rapid compressions, we found that the condensed phase formed beautiful foam-like structures and circular domains of different sizes at very low area densities. The circular domains developed holes (gas bubbles). As the compression of the films proceeded, those domains did not coalesce easily. Instead, the films prefer to form multilayers. Using concentrated spreading solutions (> 1 x 10^{-4} M) and slow compressions, multilayers were formed just after the deposition of the sample.