

Surface chemistry induced droplet dynamics

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We present an experimental study of droplet motion induced by a surface energy gradient created by patterned self-assembled monolayers of hydrophobic molecules. Using standard lithographic tools we create well-defined patterns consisting of alternating hydrophobic and hydrophilic stripes. By changing the relative widths of the stripes, a gradient is formed changing from predominantly hydrophobic to mostly hydrophilic. The well-defined patterns enable analysis of the motion of the droplets with respect to the combination of the patterns it is in contact with at a given moment. Moreover, the effect of controlled changes in the stripe pattern on the droplet speed is quantitatively investigated.