

# Dependency of Contact Angle Hysteresis on Crystallinity for *n*-Alkane Substrates

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**Summary:** Changes in dynamic contact angle for the wetting of heat-treated paraffin wax surfaces were reported. These changes appear to result primarily from a reduction in crystallinity. Along with global changes in crystallinity, modifications to the local crystallinity were observed using Raman confocal microscopy. Specifically, it is shown that the heat treatment increased the heterogeneities of the wax surfaces by producing micrometer-scale amorphous regions. These regions are believed to act as hydrophilic defects on the wetted surface, impacting almost exclusively receding angle measurements.

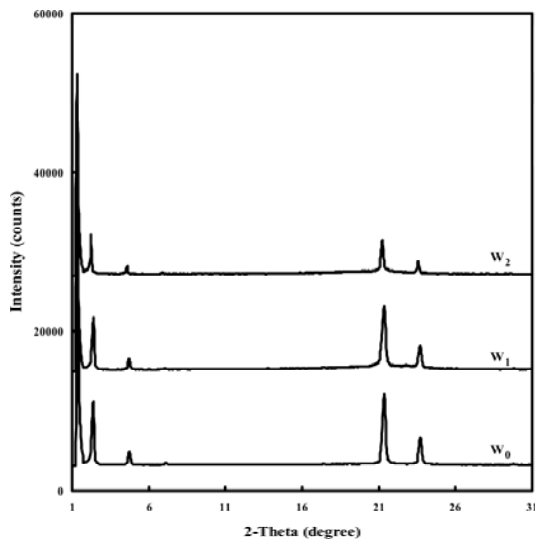


Figure 1. X-ray diffraction analysis of the paraffin wax samples carried out at room temperature.

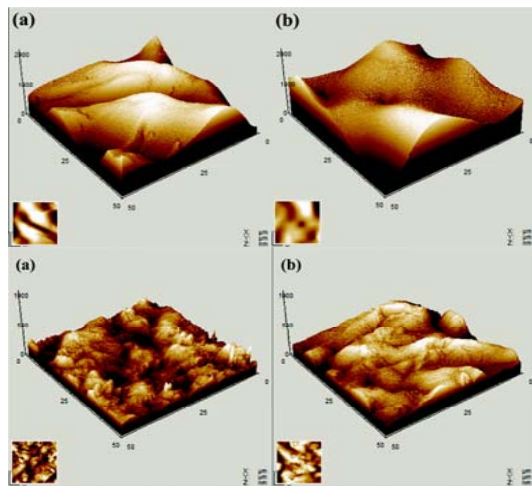


Figure 2. AFM surface analysis of the unsmoothed and smoothed surface.

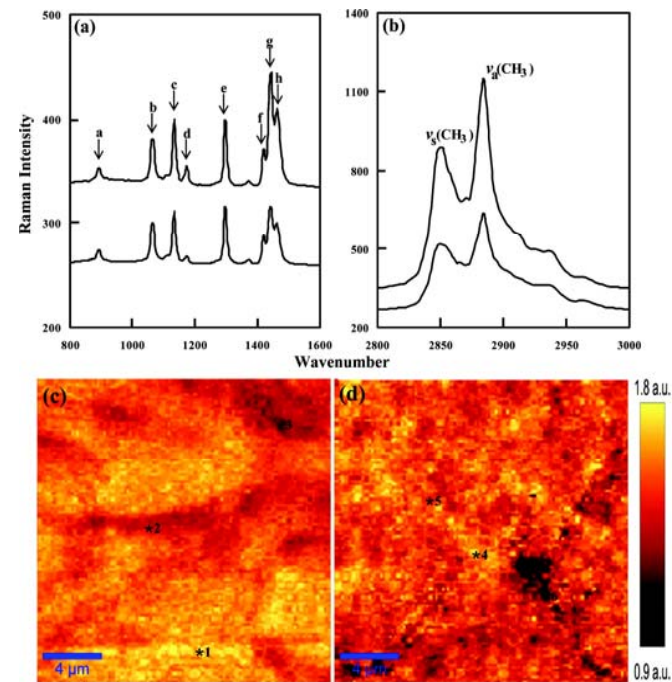


Figure 3. Raman confocal microscopy analysis of the paraffin wax before and after heat treatment in the (a)  $\nu(\text{C}-\text{C})$  and (b)  $\nu(\text{C}-\text{H})$  regions (top, unheated; bottom, heated), and the mapping of the intensity ratios of 12884/12852 on wax sample surfaces for the (c) unheated and (d) heated samples. These ratios range between 1.8 and 0.9; for example, values for the “\*” marked regions are 1 = 1.8, 2 = 1.4, 3 = 1.2, 4 = 1.8, 5 = 1.4, and 6 = 0.9.

Gang Pu, Steven J. Severtson. *J. Phys. Chem. C, Article ASAP, 2009*