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Why Test Inks Cannot Tell the Whole Truth About Surface Free Energy of Solids

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If information about a solid surface free energy (SFE) is needed, contact angle measurements and ink tests are two of the most frequently used methods. Here we present a comparative study of contact angle measurements and ink tests on 13 different materials. We observed major differences in the SFE values obtained by these two techniques and explained the differences on the basis of basic theoretical concepts of both methods. We found that test inks fail to monitor the efficiency of atmospheric plasma treatments on low surface energy solids. Moreover, we determined the polar and dispersion contributions to the test inks total surface tension (ST) in order to provide a more detailed understanding of these methods to determine a solid SFE.

Keywords

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