

## عنوان مقاله:

Design and Fabrication of a Portable Smartphone-based Contact Angle Measurement Instrument with 3D Printing Technology for Surface Sciences and Engineering Applications

## محل انتشار:

هفتمین کنفرانس بین المللی فیزیک، ریاضی و توسعه علوم پایه (سال: 1402)

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## خلاصه مقاله:

In plasma surface treatment, measuring contact angle of a water droplet deposited on a solid surface within a few minutes after plasma treatment is necessary for wetting studies. However, the traditional and commercially available measurement instruments are usually expensive and are not typically accessible to most of the students at laboratories. Thus, in this study, digital fabrication technology (3D printing) was employed to fabricate a low-cost, compact size and portable setup for measuring the contact angle of water (WCA) on such materials as glass, silver thin film, and gray cast iron using a smartphone before and after treatment. This setup consists of a stable base for holding the smartphone, a 5 microliter ( $\mu\text{l}$ ) Hamilton syringe as the liquid drop injection system, and an easily adjustable stage to hold the syringe. The experimental results show that proposed instrument can easily be used to measure the WCA of both hydrophobic and hydrophilic surfaces.

## کلمات کلیدی:

Contact angle, three dimensional (3D) printing technology, argon atmospheric pressure plasma treatment, Smartphone, Measurement

## لینک ثابت مقاله در پایگاه سیویلیکا:

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