

Abstract Submitted
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Pattern formation from dried drops can be used to identify adulterated medicines YOJANA CARREON¹, Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, IVAN CIPRIANO-URBANO, Universidad Autónoma de Coahuila, FRANCISCO SOLORIO-ORDAZ, JORGE GONZALEZ-GUTIRREZ, Facultad de Ingeniería, Universidad Nacional Autónoma de México, ROBERTO ZENIT, Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México — It is estimated that in Europe, from 2009 to 2012, 12.8 million of patients were exposed to counterfeit medicines. In Mexico, it is suspected that, between 2006 and 2013, many children suffering from cancer received distilled water instead of chemotherapeutic drugs. Fluid mechanics can be used to prevent such vile acts. Here we propose a simple method to detect the authenticity of medical substances, considering the patterns formed by dried drops. The method is based on the structural analysis of patterns generated after the solvent of a drop of liquid medicine has evaporated over a solid substrate. We exploit the capillary flux and the ionic interactions as a natural aggregation mechanism to form patterns, which reveals unique structures for each active ingredient or drug. We demonstrate that the first-order statistics (FOS) and gray level co-occurrence matrix (GLCM) are sufficient metrics to distinguish among deposits generated by pure and adulterated drugs with an accuracy greater than 90%.

¹'Membership Pending'

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