

Abstract Submitted
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Front instabilities, confinement effect and fracture in drying colloidal nanoparticle DEEDER AURONGZEB, The University of Akron, Department of Polymer Science. — Drying colloidal suspension of oxide nanoparticle can fracture in fractal patterns. While similar in size TiO_2 and Al_2O_3 particles can fracture differently. We found that Alumina nanoparticle forms radially inward crack from the edge of the droplet or planer film like fluid while Titania nanoparticle form fractal cracks. Using polarized light we observe stress field formation during evaporation and crack growth. We find that crack direction is driven by surface tension rather than thermal energy of the suspended nanoparticle. Evaporation based nanoparticle assemble and effect of confinement and electric current will be also discussed.

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