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How surface functional groups influence fracturation in nanofluids droplets dry-outs[1] DAVID BRUTIN, FLORIAN CARLE, Aix-Marseille University - UMR 7343 IUSTI Laboratory — We report an experimental investigation of the drying of a deposited droplets of nanofluids with different surface functional groups. For identical nano-particles diameter, material and concentration, identical drying conditions, the substrate and the functional groups at the nano- particles surface are changed. Both flow motion, adhesion, gelation and fracturation occur during the evaporation of this complex matter leading to different final typical patterns. The differences in between the patterns are explained based on the surface chemical potential. Crack shapes and wavelengths are globally proportional to the electrical charges carried at the nano- particles surface which is a new parameter to implement in existing predicting models. Presently only the colloid concentration and softness and the deposit thickness are used (Allain and Limat, 1995). C. Allain and L. Limat, Regular Patterns of Cracks Formed by Directional Drying of a Colloidal Suspension, Phys. Rev. Lett., 74, 2981-2984 (1995).

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