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Surface wettability and triple line behavior controlled by nano-coatings: effects on the sessile drop evaporation[1] BENJAMIN SOBAC, DAVID BRUTIN, Université de Provence, JERÔME GAVILLET, CEA LITEN, IUSTI UMR CNRS 6595 TEAM, CEA LITEN TEAM — Sessile drop evaporation is a phenomenon commonly came across in nature or in industry with cooling, paintings or DNA mapping. However, the evaporation of a drop posed on a substrate is not completely understood due to the complexity of the problem. Here we investigate, with several nano-coating of the substrate (SiOx, SiOc and CF), the wettability and the triple line dynamic of a sessile drop under natural phase change. The experiment consists in analyzing simultaneously the kinetics of evaporation, internal thermal motion and heat and mass transfer. Measurements of temperature, heat-flux and visualizations with visible and infrared cameras are performed. The dynamic of the evaporative heat flux appears clearly different for a drop evaporating in pinned mode than in receding mode. Moreover, the kinetics of evaporation, the internal flow structure and the evaporative heat flux are drastically influenced by the wettability the substrate.

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