Numerical study of thermo-solutal convection induced by evaporation BENOÎT TROUETTE, ERIC CHÉNIER, CLAUDINE DANG VU DELCARTE, FRÉDÉRIC DOUMENC, BÉATRICE GUERRIER — During the drying of a volatile solution, both termal and mass effects are coupled. The instability mechanism is first of the solutal Marangoni type. In order to understand why experimentalists observe thermal convective patterns at the beginning of the process, numerical studies are performed and thermal and mass effects are separately studied. In both cases, convection is considered as significant when the Péclet number (Pe) is greater than 1. The time evolution of Pe is studied to explore the transient character of the problem. A stability map as a function of experimental parameters (thickness and viscosity of the solution) is drawn and the results are compared with expermimental datas. A comparison between solutal and thermal induced velocities and wave lenghts is also provided.

Benoît Trouette