

ABSTRACT

A new in situ technique for aqueous two-phase systems is presented which allows concentration measurements with a micrometer space resolution. The method combines the advantages of imaging and spectroscopy. The Raman scattered light from a chain of freely moving, evaporating microdroplets has been collected with a CCD camera. The Raman signals from water vapour and from liquid water could be separated. After calibration, the absolute concentrations of water in both phases could be measured simultaneously. The optics which collected the scattered light were set up in such a way that the direction of the dispersion of the monochromator and the direction of the droplet chain propagation were parallel to one axis of the CCD sensor. Therefore, from the intensity distribution along the second axis the water concentrations can be derived as a function of the distance from the axis of the droplet chain. A spatial resolution of $2,5 \mu\text{m}$ can be achieved.