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Comparison of ultrasonic distillation to sparging of liquid mixtures HAN JUNG PARK, HYE YUN JUNG, JOSEPH CALO, GERALD DIEBOLD, Brown University / Department of Chemistry — The application of intense ultrasound to a liquid-gas interface results in the formation of an ultrasonic fountain and generates both mist and vapor from the liquid. Here, the composition of the vapor and aerosol above an ultrasonic fountain is determined as a function of irradiation time and compared with the results of sparging for five different solutions. The experimental apparatus for determining the efficiency of separation consists of a glass vessel containing a piezoelectric transducer driven at either 1.65 or 2.40 MHz. Dry nitrogen is passed over the ultrasonic fountain to remove the vapor and aerosol. The compositions of the liquid solutions are recorded as a function of irradiation time using gas chromatography, refractive index measurement, nuclear magnetic resonance, or spectrophotometry. Data are presented for ethanol-water and ethyl acetate-ethanol solutions, cobalt chloride in water, colloidal silica, and colloidal gold. The experiments show that ultrasonic distillation produces separations that are somewhat less complete than what is obtained using sparging.

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