

EVAPORATION OF NITROBENZENE
DROPLETS UNDER ACTION
OF OPTICAL RADIATION

*G. M. Verbinskaya, O. A. Zagorodnyaya, V. N. Mal'nev,
V. M. Nuzhnyi, T. A. Cheusova*

Taras Shevchenko Kyiv National University
(6, Prosp. Academician Glushkov, Kyiv 03680, Ukraine)

S u m m a r y

We present the results of the experimental study of an influence of optical illumination on the evaporation rate of nitrobenzene droplets in the atmosphere of dry nitrogen at a temperature of 20 °C in a wide range of pressures. We have found an increase in the evaporation rate of nitrobenzene under optical illumination in comparison with the evaporation regime with no illumination. It is important that the temperatures of droplets in both regimes were practically the same. We have also established that the illumination increases the evaporation rate of polar liquids only. The illumination action increases with the electric dipole moment of molecules. We propose the mechanism of the increase in the evaporation rate of polar liquids. The illumination excites the vibration levels of polar molecules. Collisions of these molecules with the droplet surface are accompanied by transformation of the vibration energy into the energy of their translation motion that causes an intensification of the evaporation rate. There is an agreement with the experiments on the qualitative level.