| | |
|---|---|
| Title | A fundamental study on heat transfer of a liquid drop |
| Sub Title | |
| Author | 信岡, 邦彦(Nonuoka, Kunihiko) |
| Publisher | 慶応義塾大学藤原記念工学部 |
| Publication year | 1966 |
| Jtitle | Proceedings of the Fujihara Memorial Faculty of Engineering Keio University (慶応義塾大学藤原記念工学部研究報告). Vol.19, No.76 (1966. ) ,p.232(14)- 232(14) |
| JaLC DOI | |
| Abstract | |
| Notes | Summaries of Doctor and Master Theses<br>Master of Engineering, 1966 |
| Genre | Departmental Bulletin Paper |
| URL | https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO50001004-00190076-0014 |

# A Fundamental Study on Heat Transfer of a Liquid Drop

Kunihiko NOBUOKA*

Fundamental data on the rate of heat and mass transfer for a droplet are of importance in the analysis of the operations of spray drying, spray cooling, humidification, combustion, and so on.

The purpose of this paper is to report a fundamental study of evaporation from a water drop. The study was restricted to a low Reynolds number, the range usually encountered in spray drying operation. The Reynolds number was ranged from 80 to 600, drop diameters was ranged from 1.7 to 2.5 mm and air temperatures was ranged from 80 from to 120°C.

A drop was suspended from a glass capillary. The glass was drawn so that small end was 0.3 mm in diameter and the other end was led to a microburet. Evaporation rate for a constant diameter drop was determined by measuring the rate of feed through the buret necessary to maintain a constant diameter. The rate of feed was controlled by water head. The liquid was warmed up to the temperature of the drop and was fed to the drop.

Equation for correlation of our experimental data was obtained as follows :

$$Nu = 2 + 0.196\,Re^{0.7}$$

when $80 < Re < 600$ and $Pr = 0.69$.

*信 岡 邦 彦