solid sphere embedded in a porous medium filled with Nano-fluid. Sains Malaysiana 41(12): 1643-1649.

[30] Oro E, Gracia A, Castell A, Farid MM, Cabeza LF. (2012). Phase change materials for cold thermal energy storage applications. Applied Energy 99: 513-533.

[31] Zhao W, Neti S, Oztekin A. (2013). Heat transfer analysis of encapsulated phase change Material for thermal energy storage. Applied Thermal Engineering 50: 143-151. https://doi.org/10.1016/j.ijheatmasstransfer.2013.03.061

[32] Kiani H, Sun D, Zhang Z. (2013). Effects of processing parameters on the convective heat transfer rate during ultrasound assisted low temperature immersion treatment of a stationary sphere. Journal of Food Engineering 115: 384-390. https://doi.org/10.1016/j.jfoodeng.2012.10.029

[33] Hashemi Z, Abouali O, Kamali R. (2014). Three-dimensional thermal heating cooling spheres falling in a newtonian liquid. International Journal of Thermal Sciences 82: 23-33. https://doi.org/10.1016/j.ijthermalsci.2014.03.008

[34] Amin NAM, Bruno F, Belusko M. (2014). Effective thermal conductivity for melting in PCM encapsulated in a sphere. Applied Energy 122: 280-287. https://doi.org/10.1016/j.apenergy.2014.01.073

NOMENCLATURE

T	temperature achieved by the solid sphere when it was dipped in the liquid nitrogen
$T\infty$	temperature of liquid nitrogen
T_i	temperature of brine solution
h	convective heat transfer coefficient of liquid nitrogen
A	surface area of sphere
t	time taken by the sphere to achieve steady state temperature
v	volume of sphere
c	specific heat capacity of stainless steel
Gr	Grashof number
Pr	Prandtl number
Nu	Nusselt number
Ra	Rayleigh number
Re	Reynold number
Ste	Stefan number
Cp	Specific heat capacity

Greek symbols

ρ	density of stainless steel
μ	absolute viscosity
β	coefficient of thermal expansion