

## **ABSTRACT**

*Nanofluids has potential to replace the conventional cooling fluid. This study examines on investigation of nanofluids water- $\text{Al}_2\text{O}_3$  by using radiator model.  $\text{Al}_2\text{O}_3$  nanoparticles are obtained by process of bayer and solgen. Natural material of bauxite ore is extracted to produce compound  $\text{Al}_2\text{O}_3$ .  $\text{Al}_2\text{O}_3$  is added sucrose, heated, then calcined to obtain  $\text{Al}_2\text{O}_3$  nanoparticles sized 6,31 nm by using characterization method Surface Area Meter.  $\text{Al}_2\text{O}_3$  nanoparticles are dispersed by water with a concentration of 0.03% volume, 0,08% volume and 0.13% volume per 300-ml water to obtain nanofluids water- $\text{Al}_2\text{O}_3$  applied to the radiator model. The result of this study is the greater the concentration of  $\text{Al}_2\text{O}_3$  nanoparticles are included, the greater the temperature drop occurs. The largest temperature drop around  $3^\circ\text{C}$  at a concentration of  $\text{Al}_2\text{O}_3$  nanoparticles 0,13% volume. The heat capacity of Nanofluid decreases as the concentration of nanoparticles is added  $\text{Al}_2\text{O}_3$ , while the rate value of heat transfer increase as increase in the difference in temperature of the fluid before and after cooled to the rate value of heat transfer is highest in nanofluids water- $\text{Al}_2\text{O}_3$  0.13 % by volume in the amount of 70.15 J / s.*

*Keywords:  $\text{Al}_2\text{O}_3$  nanoparticles, nanofluids water- $\text{Al}_2\text{O}_3$ , the radiator model, coefficient of performance*