Turbulent heat transfer to separation nanofluid flow in annular concentric pipe

Hussein Togun a, *, S.N. Kazi b, A. Badarudin b

a Head of Biomedical Engineering Department, University of Bas-Qar, 64901 Nasiriyah, Iraq
b Department of Mechanical Engineering, University of Malaya, 50603 Kuala Lumpur, Malaysia

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Abstract
Turbulent heat transfer to separation nanofluid flow in annular concentric pipe were studied numerically and experimentally. In the numerical study, finite volume method with standard k-ε turbulence model in three-dimensional domain was selected. Three different types of water based (Al2O3, CuO, TiO2) nanofluids were employed in this simulation. The adopted boundary conditions were, expansion ratio (ER = 1.25, 1.67, and 2); Reynolds number ranging from 20,000 to 50,000; water based nanofluids used Al2O3, CuO, TiO2 with volume fractions varied between 0 and 2% at different heat fluxes. Varied from