



GAVIN CONFERENCES

International Conference on Petrochemical Engineering

July 10-12, 2017 Dubai, UAE

Numerical study of Al_2O_3 nanofluid coolant for pebble bed reactor

Masoumeh Sadat Latifi

Amirkabir University of Technology, Italy

Recently nanofluids have been investigated as coolants for chemical and nuclear reactors. In this work, a thermal-hydraulic investigation of Al_2O_3 nanofluid as a coolant in a pebble bed reactor core has been performed using a porous media approach. Three different volume fractions of Al_2O_3 have been employed for the numerical simulation. The pebble bed reactor is a kind of packed bed reactors whose core is a long right circular cylinder with a height of 4.5m and an outer diameter of 3.7 m. The finite volume method was used to solve the governing equations using ANSYS FLUENT 14.5. Several important thermal hydraulic parameters have been investigated consisting of the coolant and solid temperatures, thermal conductivity of the packed bed, and the coolant temperature. Results shows that the heat transfer increases with nanoparticle volume concentrations. The conclusion of the analysis is that the nanofluids would be suitable coolants for using in pebble bed reactors due to its heat transfer characteristic.

Biography

Masoumeh Sadat Latifi is an instructor at Kish Institute. She did her research at Amirkabir University of Technology. She has published several research articles, one handbook in mechanical and chemical engineering field. She has been serving as a reviewer for reputed journals like Powder Technology and Thermal Engineering.