Au-Water Nanofluid: Experimental Measurements and Numerical Simulation of the Yearly Yield of a Parabolic Trough Collector

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In recent years, nanofluids, i.e. dispersions of solid particles into common fluids, have been studied to enhance the efficiency and performance of the solar thermal systems due to their enhanced thermophysical properties. In this work, thermal conductivity and dynamic viscosity of a water based gold nanofluid were measured and the nanoparticle stability was investigated. Experimental data were used as input for a numerical simulation to analyze the effects of nanofluids on the performance of a parabolic trough solar collector (PTC). Here, a direct comparison with the base fluid is provided in order to prove the convenience in the adoption of nanofluid as energy media.