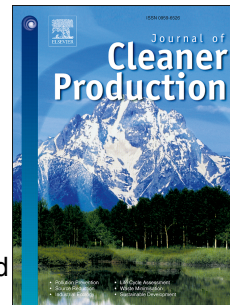


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An experimental study on stability and thermal conductivity of water/silica nanofluid:
Eco-friendly production of nanoparticles

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Amount of words? 6780 words**An experimental study on stability and thermal conductivity of water/silica nanofluid: eco-friendly production of nanoparticles**

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Abstract

In the present experimental study, an eco-friendly process (synthesized from rice plant source) was used to produce silica nanoparticles. Silica nanoparticles are environmentally friendly nanoparticles that have high heat transfer potential due to its abundant natural resources, low cost synthesis and mass production. The surface and atomic structure of the nanoparticles have been investigated through SEM and FTIR tests. After production of nanoparticles, water/silica nanofluid samples were prepared using two-step method that called eco-friendly nanofluid. Stability and thermal conductivity of the eco-friendly nanofluid were examined. Investigating the stability of the prepared samples, the DLS and TEM tests have been conducted as well as periodic visual observation of possible sedimentation over a period of six months through photography. The stability results indicated that the prepared samples possess excellent nano-structure and it showed long-time stability even after six months of preparation. The thermal conductivity measurement of the samples has been done in different temperatures ranging from 25 to 55 °C and solid volume fractions of 0.1, 0.25, 0.5, 1, 1.5, 2, 2.5, and 3 %. The results showed the maximum thermal conductivity

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