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Energetic and Exergetic Analysis of a Domestic Refrigerator System with LPG as a replacement for R134a Refrigerant, using POE lubricant and Mineral Oil based TiO_2 -, SiO_2 - and Al_2O_3 -lubricants

Jatinder Gill , Jagdev Singh , Olayinka S. Ohunakin ,
Damola S. Adelekan

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Highlights

- Energetic and exergetic performance analysis of domestic refrigerator using R134a and LPG refrigerants with different lubricants was carried out.
- Energetic and exergetic performance parameters of domestic refrigerator using LPG refrigerant with nano-lubricants are better than R134a with POE.
- Nano-lubricant based on TiO_2 was chosen as the optimal nano-lubricant, based on the energetic and exergetic performance in this study.
- The compressor discharge temperature was the lowest for LPG refrigerant using SiO_2 based nano-lubricant.

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