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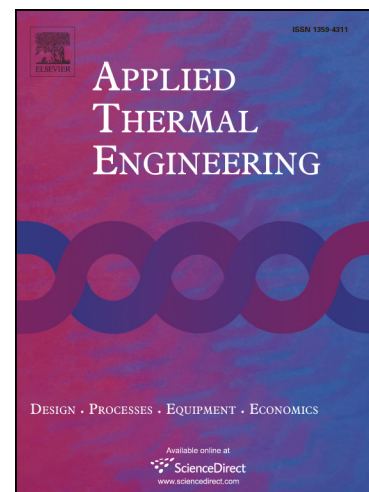
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**Non-equilibrium thermodynamics approach for the coupled heat and mass  
transfer in microwave drying of compressed lignite sphere**

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**Abstract:** The microwave drying of materials is a typical non-equilibrium process. Based on the non-equilibrium thermodynamics fundamentals, a transport model related to the thermal and moisture migration, and molecular polarization coupling transmission mechanism was developed. The microwave drying behavior for the compressed lignite sphere (20 mm in diameter) was simulated numerically in the lignite of the proposed model at the microwave power levels of 231-700 W. The calculated values for the drying and temperature profiles of the sample fitted well the experimental ones with the average deviation of 10% and 16%, respectively. The pumping phenomenon occurred in the sample during the microwave drying according

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